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GRASSY BALDS OF GREAT SMOKY MOUNTAINS NATIONAL PARK: VASCULAR PLANT FLORISTICS, RARE PLANT DISTRIBUTIONS, AND AN ASSESSMENT OF THE FLORISTIC DATA BASE

RESEARCH/RESOURCES MANAGEMENT REPORT SER-58

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UPLANDS FIELD RESEARCH LABORATORY
GREAT SMOKY MOUNTAINS NATIONAL PARK
TWIN CREEKS AREA
GATLINBURG, TENNESSEE 37738

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RESEARCH/RESOURCES MANAGEMENT REPORT SER-58

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ABSTRACT

A floristic list for the grassy balds of Great Smoky Mountains National Park was compiled from herbarium collections and previous studies encompassing four time periods: 1930s, 1950s, 1960s, and 1970s. Of the 11 balds for which data was available, only Andrews, Gregory, Spence Field, Parsons, and Silers Balds were sampled consistently enough to be analyzed in detail. Two hundred ninety-three vascular plant species have been reported for the balds. The highest number of species (178) was reported in the 1930s, while the 1960s had the fewest species (155). The total number of species reported for each bald varied from 175 species (Gregory Bald) to 87 species (Silers Bald). Species richness was not related to bald size. There was no consistent difference in the number of reported forest species, nor was there a significant difference in the number of exotics reported in the four time periods. Most balds probably reached peak diversity during the 1950s and 1960s, both in terms of herbaceous and woody plants. Although the literature reveals a great increase in woody cover on the balds, floristic records show a relatively constant number of reported woody species on each bald since the 1930s. The species are patchily distributed on balds. Each species occurred on an average of 1.99 balds and each bald showed a species turnover of approximately 30 percent per decade. Coefficients of community are highest for pairs of balds that are close geographically. There are several sources of uncertainty in the data base and a monitoring regime will have to be established to enable managers and biologists to accurately understand the floristic change now in progress.

The balds support rare plants, including four taxa that are restricted to balds in Great Smoky Mountains National Park (Helianthemum

bicknellii, Rhododendron bakeri, Rhododendron viscosum var. montanum, and Salix humilis var. microphylla). Nineteen species (6.5 percent of the balds flora) are on either state or national lists. There are only two known extirpations of rare plants on balds: Helianthemum bicknellii and Geum radiatum; the latter persists elsewhere in the park. Most bald species are known from other nongrassy balds habitats in Great Smoky Mountains National Park.

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INTRODUCTION

The grassy balds have been one of the most thoroughly studied community types in Great Smoky Mountains National Park (GRSM). These high elevation, treeless communities are anomalous in the sense that there is no climatic treeline at this latitude. Hence, interest in the grassy balds often has centered on whether they are natural or anthropogenic in origin (Wells 1937; Camp 1931; Billings and Mark 1957; Mark 1958; Gilbert 1954; Bruhn 1964; Gersmehl 1970; Lindsay and Bratton 1976, 1979a). Some of these studies have also included detailed information on the vegetation of the balds in relation to site factors and successional trends. Despite this widespread interest in bald origin and succession, key issues remain. For example, apart from studies of woody species invasion, the overall floristic changes now occurring on the balds have not been thoroughly assessed. These floristic changes are of managerial concern, particularly with regard to the distribution of rare plants.

This report integrates previous studies of GRSM grassy balds to produce (1) a basic balds flora, past and present, (2) an assessment of rare plants in the balds flora, (3) an analysis of the importance of exotic species, and (4) an evaluation of the data base for monitoring continuing floristic changes. The flora of the balds was assessed for four time periods: 1930s, 1950s, 1960s, and 1970s. Of particular interest were: changes in the number of species present (species richness), the species/area relation for the balds, and changes in habitat preference of the balds flora (in order to assess the role of succession in species richness and flux). Although the grassy balds make up a small percentage of the landscape (ca .015 percent in GRSM), they are one of the most diverse high

elevation community types in GRSM (Ramseur 1960); this report assesses their contribution to the floristic diversity of the park.

GRSM Grassy Balds: An Overview

Ramseur (1960) recognized three types of balds: grassy balds, shrub balds, and heath balds. Grassy balds are dominated by grasses, as their name implies. Shrub balds are dominated by mixtures of grassy swards, shrub colonies, and low stature trees. Heath balds are floristically poor and dominated by evergreen shrubs of the heath family. All of the balds evaluated here are "grassy balds," in Ramseur's sense of the term, although all of these areas have been invaded by trees and shrubs. Some areas have been termed "fields" because their origin has been documented as both relatively recent and anthropogenic (these are the "artificial" balds of Gersmehl 1970). These have been included in the present report. On the other hand, some wooded areas with grassy understories, also termed "balds" historically, were not included in this analysis (these are the "nominal" and "forested" balds of Gersmehl 1970). Burn scars and heath balds were likewise not included here.

Gersmehl (1970) recognized 44 balds in the Great Smoky Mountains. Of these, 17 were "forested" or "nominal" balds and six were located outside the national park boundaries. Of the remaining 21 balds, we have included 17 here (Table 1 and Figure 1). We have also added one other area (Welch Bald) for a total of 18. (Welch Bald is now separate from Silers Bald, but probably was once part of that bald; see Lindsay and Bratton 1979b.) remaining four balds cited by Gersmehl (1970) include three "apparent" balds (small open areas which Gersmehl did not verify as grassy balds; Camel Gap, Chiltoes Mountain, and Inadu Knob) and one "historic" bald (Derrick

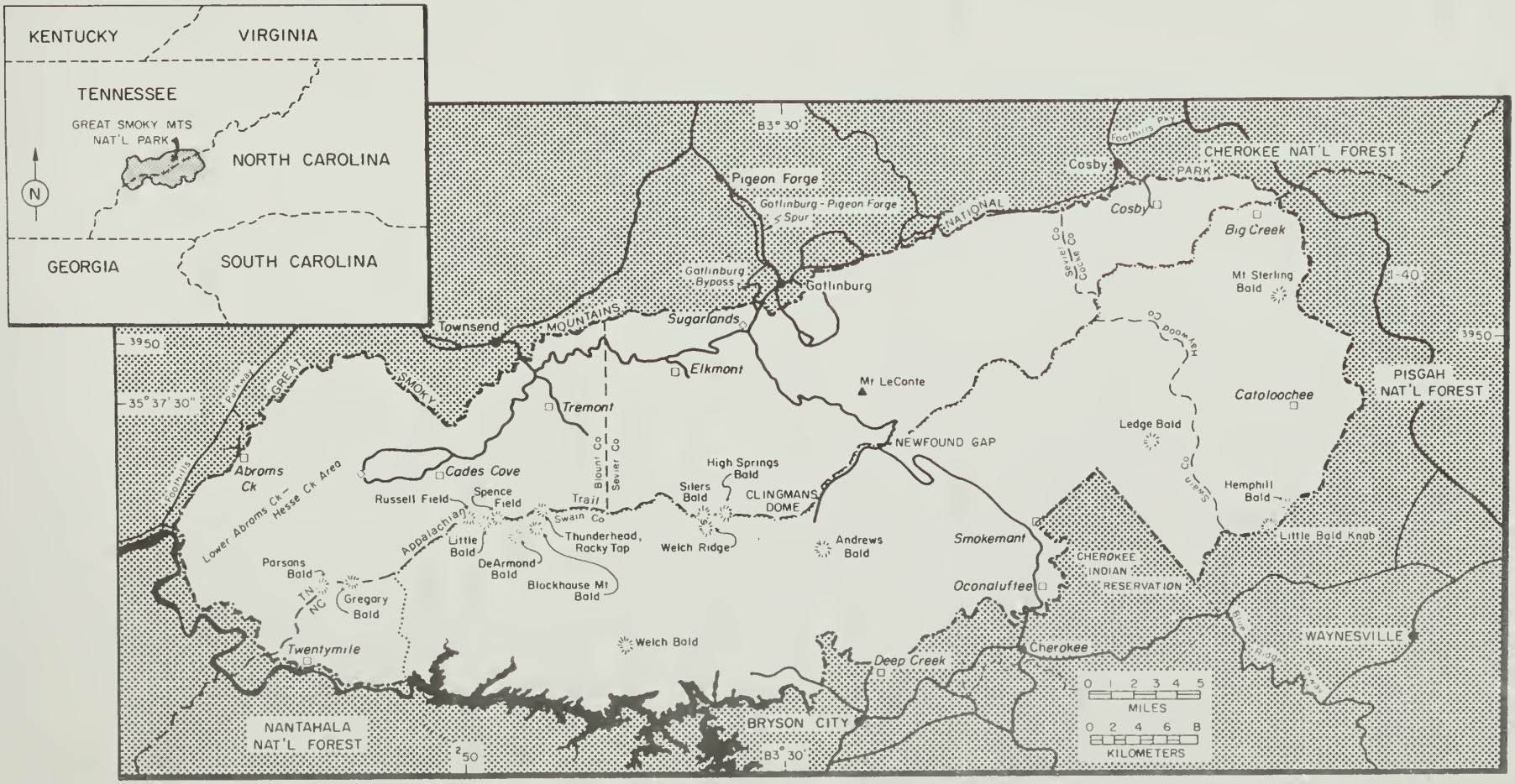
Table 1. List of GRSM grassy balds with approximate size in 1979 and average elevation. The total area of grassy balds (ca 30 ha) accounts for ca .015 percent of the GRSM landscape. For information on other balds, no longer open, see Gersmehl (1970). Data are from an unpublished map prepared by Don Stratton. Total species lists could only be assembled for five balds; however, the total number of species is based on all balds records (see footnote).

Bald	Area (ha)	Average Elevation ft.	m	No. of Species
Spence Field	8	4900	1490	139
Russell Field	4.5	4400	1340	
Parsons Bald	3.5	4700	1430	90
Gregory Bald	3	4900	1490	175
Andrews Bald	3	5600	1710	146
Thunderhead Mountain and Rocky Top[2]	2	5400	1650	
Mt. Sterling	2	3500	1680	
Silers Bald and Welch Ridge Bald[2]	1.5	5500	1680	87
Little Bald	1	4900	1490	
Welch Bald[1]	5	4800	1460	
De Armond and Blockhouse Mt. Balds[1]	5	5000	1520	
High Springs Bald[1]	5	5400	1650	
Other, historically open balds (Hemphill Bald, Little Bald Knob,[1] Ledge Bald)	<.5			
Total	30.5 ha			293
mean	2.5 ha	5100	1550	

[1]Floristic data for these balds were not available; the data matrix is based on the other thirteen balds.

[2]The data for certain pairs of balds were summed (Thunderhead and Rocky Top, Silers and Welch Ridge Balds), leaving a total of eleven areas.

Figure 1. Distribution of grassy balds in GRSM.


KENTUCKY
VIRGINIA
TENNESSEE
GREAT SMOKY MTS NAT'L PARK
NORTH CAROLINA
GEORGIA
SOUTH CAROLINA
N
83° 30'
35° 37' 30"
Pigeon Forge
Gatlinburg - Pigeon Forge Spur
Gatlinburg Bypass
Gatlinburg
Sugarlands
Townsend
MOUNTAINS
GREAT SMOKY
Parkway
Foothills Pkwy
Elkmont
Tremont
Mt LeConte
NEWFOUND GAP
Cades Cove
Abroms Ck
Lower Abroms Ck
Hesse Ck Area
Blount Co
Sevier Co
Swain Co
Trail
Appalachian
Russell Field
Spence Field
Little Bald
DeArmond Bald
Thunderhead, Rocky Top
Blockhouse Mt
Bald
Parsons Bald
Gregory Bald
TN
NC
Twentymile
Welch Bald
High Springs Bald
Silers Bald
CLINGMANS DOME
Welch Ridge
Andrews Bald
Smokemont
Oconaluftee
Deep Creek
Cherokee
BRYSON CITY
NANTAHALA NAT'L FOREST
CHEROKEE INDIAN RESERVATION
CHEROKEE NAT'L FOREST
PARK
NATIONAL
Cosby
Big Creek
Mt Sterling Bald
I-40
Sevier Co
Cocke Co
Haywood Co
Swain Co
Catoloochee
Ledge Bald
Hemphill Bald
Little Bald Knob
PISGAH NAT'L FOREST
WAYNESVILLE
Blue Ridge Pkwy
0 1 2 3 4 5
MILES
0 2 4 6 8
KILOMETERS

Knob or Big Chestnut Bald). Aerial photographs revealed that openings were small on these areas and, hence, they were omitted here. One of them, Derrick Knob, was treated as a shelter clearing by Lindsay and Bratton (1979b).

There are eighteen open, at least partly grass dominated, balds and fields in GRSM (Table 1 and Figure 1). The largest is Spence Field (ca 8 ha), but most range from one to four ha. Together the balds account for only .015 percent of the GRSM landscape (Don Stratton, unpublished vegetation map). Balds are found from mid-elevations (Russell Field, 4400 ft [1340 m]) to high elevations (Andrews Bald, 5600 ft [1710 m]) on exposed ridge crests (convex, gently to steeply sloping topography). The balds are concentrated along the Tennessee-North Carolina state line in western GRSM (only four of the eighteen balds listed in Table 1 are east of Newfound Gap and only five are east of Clingmans Dome).

The evidence for anthropogenic origin of the balds is strong, but in most cases circumstantial. Extrapolation from the mountains of New England and New York southward predicts that treeline at the latitude of the Southern Appalachians should occur between 7000 and 8000 feet (2135 to 2440 m) (C. Cogbill and P. White, unpublished data). This is higher than the highest mountains in GRSM (ca 6600 ft, 2010 m), which, indeed, are forested to their summits. The GRSM balds do not occur at the highest elevations but on summits ca 1500 feet (460 m) below the highest elevations. Although the balds are found in only a limited elevation range and on characteristic summit topography, they occur on a low percentage of seemingly appropriate sites. Finally, the balds have a documented grazing history (Lindsay and Bratton 1976) and some of them have known anthropogenic origins (Lindsay and Bratton 1979a).

Even though the question of bald origin remains a controversial one, two facts have been convincingly demonstrated by past research: (1) grassy balds are universally being invaded by trees and shrubs (Bruhn 1964; Lindsay and Bratton 1980) and (2) when the National Park Service took over management of the balds, they had a recent history of livestock grazing--that is, their state at the time of park establishment in the 1930s was largely the result of this grazing history. Andrews Bald was grazed until 1931, Spence Field until 1933, and Gregory Bald until 1936. Since the mid-1930s, the balds have been steadily decreasing in size due to encroachment by woody plants. This successional rate of woody plants is slower on the balds than on pastures at lower elevations (where 1930s farm fields are already tree-covered). However, if present trends continue, the balds will be covered by a woody canopy in 50 to 70 years (Ramseur 1976; Lindsay and Bratton 1980). This stiking habitat change is a primary reason for the assessment of floristic changes in this report. Descriptions by others of the balds flora as "unique" and in need of protection were also important in our undertaking this synthesis of balds data. A thorough assessment of native rare plants on the balds is particularly timely for park managers.

METHODS

A floristic list for GRSM grassy balds was compiled from published papers (Wells 1939; Lindsay 1979b), Ph.D. dissertations and Masters theses (Bruhn 1964; Gilbert 1954; Mark 1958), unpublished field data (of the authors and others, see below), and herbarium specimens. Species were recorded as present or absent in four time periods: (1) "1930s" (1930-1945), (2) "1950s" (1950-1960), (3) "1960s" (1969-1970), and (4) "1970s" (1970 to the present).

Only two studies, Bruhn's (1964) study of Andrews Bald, Gregory Bald, and Spence Field, and Gilbert's (1954) study of Andrews Bald, Gregory Bald, Spence Field, Parsons Bald, and Silers Bald, claimed to include complete floristic lists for individual balds (however, additions were made to both of these lists from herbarium collections of the same time period). Unpublished data of M. Lindsay, H. Tatelman (1974) and R. H. Whitaker (1962) were used. In addition, herbaria at the Great Smoky Mountains National Park, University of Tennessee, Duke University, and the University of North Carolina were examined for grassy bald records. Herbarium records citing locales as "vicinity of" or "near" balds were not included.

Some balds have received more botanical attention than others. The thirteen balds for which specific records were available were included in the primary list (see Table 1), but only five (Andrews Bald, Gregory Bald, Spence Field, Parsons Bald, and Silers Bald) were sampled consistently and completely enough to be analyzed in terms of the four time periods of interest.

The floristic lists were compiled from the work of many different investigators. Although it is relatively easy to document the presence of a particular species on a bald, its absence on a neighboring bald or at a different time on the same bald may be attributable to incomplete sampling, taxonomic disagreements between investigators, or disagreements over how the "edge" of the bald was defined, in addition to actual local species flux. Much of the data is from ecological work in which the balds were sampled rather than thoroughly inventoried (the exceptions being the aforementioned floristic lists of Gilbert [1954] and Bruhn [1964]).

In additon to presence/absence data for each bald, general ecological data were also assembled. Plants were classified as characteristic of

predominantly open areas, forested areas, or found in both open and closed habitats (see habitat descriptions in Radford et al. 1968 and White 1982). Rare plants (from unpublished data of P. White) and exotic species were noted.

Nomenclature follows White (1982). Nomenclatural revision was frequently needed for the older literature. In addition, records for some species considered to be doubtful were dropped from the list (those species which were not known to occur in GRSM and were not documented by herbarium specimens). Ecologists often had to work with sterile specimens while sampling; this accounts for some of the misidentifications and also of the citation of "Aster spp.," "Carex spp.," "Solidago spp.," "Vaccinium spp.," "Viola spp.," and the like. In all, 38 species were eliminated from the lists, lumped with other species, or redetermined.

The data were analyzed using the Statistical Analysis System (SAS Institute, 1979) available at the University of Tennessee Computing Center.

RESULTS

Floristics

Two hundred ninety-three vascular plant species have been reported for GRSM grassy balds (Table 2 and Appendix 1). The balds flora is made up of the following plant categories: herbaceous angiosperms (73.7%), woody plants (22.5%), and pteridophytes (5.7%). These percentages approximate those for the flora of GRSM as a whole--woody plants and pteridophytes are slightly over-represented and the herbs are slightly under-represented (see Table 2). The seven largest families on the balds are: Asteraceae (53

Table 2. Summary statistics of the GRSM grassy balds flora (data for the total park flora taken from White 1982).

	Total Species			Exotic Species		
Group	No. of Species	Percent in balds flora	Percent in GRSM flora	No. of Species	Percent in balds flora	Percent in GRSM flora
Herbaceous angiosperms	216	73.7	75.0	30	13.9	16.1
Woody plants	66	22.5	21.0	0	0	23.0
Pteridophytes	11	5.8	4.0	0	0	0
Total	293			30	10.2	20.0

species, Poaceae (22 species), Ericaceae (20 species), Cyperaceae (19 species), Rosaceae (16 species), Liliaceae (11 species), and Violaceae (12 species). Five of these seven families are also five of the six largest families in the park's flora as a whole (White 1982). The rank order of families on balds is different from their rank order in the total GRSM flora. The Ericaeae (third most important balds family but eleventh in the flora as a whole) and Violaceae (seventh most important balds family but fourteenth in the flora as a whole) were relatively more important on balds, and the Fabaceae (sixteenth most important balds family but fifth most important in the flora as a whole) was relatively unimportant on balds.

The balds flora includes 30 exotic species (10.2%). This is just over one-half the percentage exotic species in the GRSM flora as a whole (Table 2). Exotic herbs are slightly over-represented and exotic woody plants are strongly under-represented on the balds.

Two categories of rare plants occur on the balds: (1) those on national or state endangered and threatened plant lists (Ayensu and DeFillips 1978: US Fish and Wildlife Service 1980; Committee for Tennessee Rare Plants 1978; Cooper et al. 1977), and (2) those rare in GRSM but not regionally or nationally listed (Table 3). The grassy balds flora includes 19 listed species (6.5% of the balds flora) and eight additional park rare plants (3.0% of the balds flora). The listed balds plants contribute 14.6 percent of all GRSM listed plants. Of the 19 listed species, seven are rare in the park, for a total of 15 rare balds species (5% of the balds flora).

Four taxa are restricted in GRSM to balds: Bicknell's rock rose (Helianthemum bicknellii), Cumberland azalea (Rhododendron bakeri), Mountain clammy azalea (Rhododendron viscosum var. montanum), and dwarf gray willow

Table 3. Listed species (from White, unpublished data) and rare species in the grassy balds flora in GRSM.

Species	Category or State of Listing (TN = Tennessee NC=North Carolina)	Rare in GRSM	Restricted to grassy balds in GRSM
Listed Species			
Abies fraseri	TN		
Cacalia rugelia	National, NC		
Carex misera	National, NC, TN		
Carex ruthii	TN	x	
Clintonia borealis	TN		
Gaylussacia ursina	TN		
Geum radiatum	National, NC, TN	x	
Glyceria nubigena	National, NC, TN	x	
Helianthemum bicknellii	TN	x	x
Hieracium scabrum	TN		
Hypericum graveolens	TN		
Hypericum mitchellianum	TN		
Platanthera psycodes	TN		
Polygonum cilinode	TN	x	
Prenanthes roarensis	National, NC		
Pycnanthemum montanum	TN		
Rhododendron bakeri	National, NC	x	x
Rubus idaeus var. canadensis	NC	x	
Stachys clingmanii	TN		
Additional Park Rare Plants			
Bartonia virginica		x	
Castillega coccinea		x	
Drosera rotundifolia		x	
Lespedeza capitata		x	
Rhododendron-hybrid complex		x	x
Rhododendron viscosum var. montanum		x	x
Salix humilis var. microphylla		x	x
Triosteum aurantiacum		x	

(Salix humilis var. microphylla). All of these species occur or occurred on Gregory Bald; in addition, the hybrid azalea complex on Gregory Bald is unique in the park. Bicknell's rock rose (Helianthemum bicknellii) has not been seen since its original collection in GRSM in 1934, despite searches for it on Gregory Bald by a number of botanists. It has been reported in the literature for Andrews Bald, but no specimen exists. Mountain avens (Geum radiatum) has been collected from only two sites in GRSM: Mt. LeConte and Gregory Bald. The former population survives, but the Gregory Bald site has not been rediscovered. In addition to these restricted species, balds are significant in the GRSM distribution of the following species: Ruth's sedge (Carex ruthii), Smoky Mountain manna grass (Glyceria nubigena), rough hawkweed (Hieracium scabrum), mountain St. Johnswort (Hypericum graveolens), Mitchell's St. Johnswort (Hypericum mitchellianum), hairy climbing buckwheat (Polygonum cilinode), and Roan's rattlesnake root (Prenanthes roanensis).

The grassy bald flora in GRSM is unrelated to the above treeline, alpine flora of the high mountains of New York and New England (Table 4). Although Southern mountain endemics are present [including the GRSM endemics (Smoky Mountain marina grass (Glyceria nubigena) and Rugel's ragwort (Cacalia rugelia)], only one is limited in GRSM to grassy balds: Cumberland azalea (Rhododendron bakeri). The grassy balds flora is, in general, a mixture of species from other habitats in the park. Although the grassy balds are distinctive in general appearance, their flora is not composed of unique elements, except for those already noted.

Only five of the grassy balds have been inventoried thoroughly and consistently enough for complete species lists: Spence Field, Andrews Bald, Parsons Bald, Gregory Bald, and Silers Bald. The two most diverse balds are

Table 4. Distributions in the GRSM grassy balds flora.

Distributional Category	No. of Species	Percent of grassy balds flora	No. species restricted to grassy balds in GRSM
GRSM Endemics	2	.7	0
Southern Appalachian Endemics	31	10.6	3
New York-New England Alpine Flora	0	0	0
Northern Species	33	11.3	1
Other	197	67.2	2
Exotics	30	10.2	0
Total	293	100	5

Gregory Bald (175 species) and Andrews Bald (146 species). There is no correlation of species richness with bald size (areal extent) or elevation (see Table 1).

The highest species total for any one time period was that reported in the 1930s (178 species); the lowest number was reported in the 1960s (155 species) (Table 5). The 1930s also had the highest total of unique species (species not reported in any of the other time periods--Table 5). The cumulative number of species reported for GRSM balds has continued to increase, but with a lowering of the percent increase from the 1950s (36% increase over 1930s) to the 1970s (a 6.5% increase over the 1960s). Exotic species did not vary significantly between time periods. The number of reported forest herbaceous plants and woody plants fluctuated, but the available records do not indicate any strong trends from the 1930s to the 1970s.

On most balds, the number of reported species reached a maximum in the 1950s and 1960s (Figure 2). For example, 27 percent more species were reported for Andrews Bald in the 1960s than in either the 1930s or 1970s. This pattern is reflected in both the herbaceous and woody species. Gregory Bald is the only exception, showing a continued increase in the reported herbaceous flora into the 1970s.

In general, species were inconsistently reported in the four time periods for individual balds. An average of 35 percent of the species reported for Andrews Bald, Gregory Bald, and Spence Field in any given time period were reported for the first time in that time period; an equivalent number was reported for the last time (Table 6). As with the data set as a whole, unique records were more frequent in the first and last time periods.

Table 5. Summary statistics for all balds by time period.

Time period	Total species reported	Cumulative no. species	Percent increase in known flora	Mean no. of bald occurrences per species	No. species unique to that time period	No. of Exotics	No. of Woody Species	No of Forest Herbs
1935	178	178		1.48	58[1]	19	31	38
1955	164	242	36	2.23	19	18	45	29
1965	155	275	14	1.66	11	17	47	24
1975	159	293	6.5	2.61	25[1]	18	42	38

[1]Since these are the first and last periods of record, these totals are over-estimates. (Years of occurrence before 1935 and persistence after the 1970s is unknown.)

Figure 2. Changes in the number of species reported for five GRSM grassy balds: A. Total species. B. Herbaceous species. C. Woody species.

A = Andrews Bald

G = Gregory Bald

Sp = Spence Field

P = Parsons Bald

Si = Silers Bald

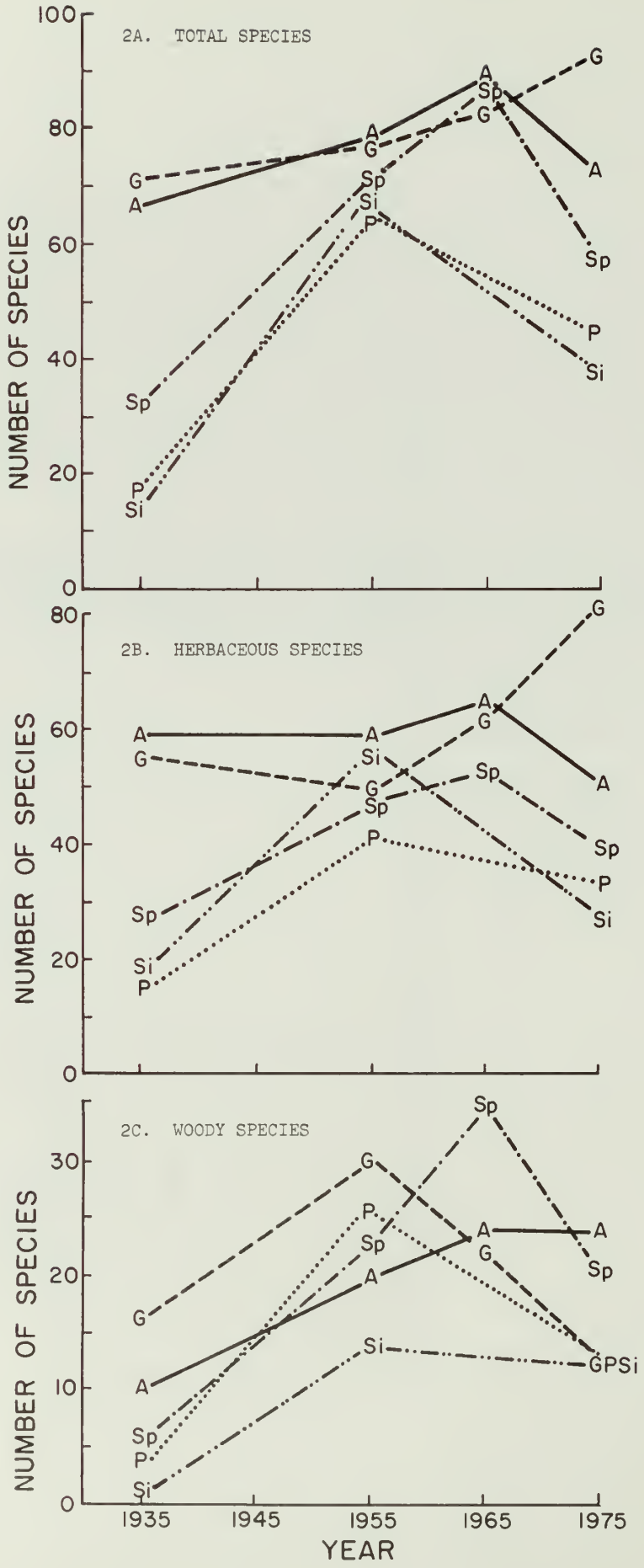

2A. TOTAL SPECIES
NUMBER OF SPECIES
100
80
60
40
20
0
G
A
Sp
Si
P
2B. HERBACEOUS SPECIES
NUMBER OF SPECIES
80
60
40
20
0
2C. WOODY SPECIES
NUMBER OF SPECIES
30
20
10
0
GPSi
1935
1945
1955
1965
1975
YEAR

Table 6. Changes in species reported for Andrews Bald, Gregory Bald, and Spence Field. (FIRST = the percent of the total species reported for the first time for the given bald in that indicated time period; LAST = the percent of the total species reported for the last time for the given bald in the indicated time period; ONLY = the percent of the total species reported for the given bald only during the indicated time period.)

Bald	1930s			1950s			1960s			1970s		
	FIRST	LAST	ONLY	FIRST	LAST	ONLY	FIRST	LAST	ONLY	FIRST	LAST	ONLY
Andrews Bald	---	32	32	54	20	18	27	39	22	16	---	16
Gregory Bald	---	45	45	67	24	22	29	36	9	28	---	28
Spence Field	---	33	33	76	26	18	37	60	31	33	---	33

Coefficients of community were computed to determine the degree of similarity among balds at the four time periods (Table 7) and among the balds for the complete species lists summed for all time periods (Table 8). Coefficient of community measures similarity based only on presence/absence data; no data on ecological importance or dominance of the species is incorporated. Hence, this analysis differs from and is not comparable to the ordinations produced by Lindsay and Bratton (1979b). The coefficient of community is computed as:

$$CC = \frac{2 \times (AB)}{(A + B)} \times 100$$

where AB is the number of species shared between the areas A and B, A is the total number of species found in area A, and B is the total number of species found in area B (Whittaker 1975).

Table 7 compares the balds at separate time periods. The coefficients of community range from 0 (Silers and Parsons Balds shared no reported species in the 1930s) to 79.45 (Gregory and Parsons Balds in the 1950s). The highest values (most floristic similarity) occur between different time periods for the same bald, although certain bald combinations frequently score a coefficient of community around 50 (Andrews and Spence, Andrews and Silers, Gregory and Spence, Gregory and Parsons, Spence and Parsons, Spence and Silers). These inter-bald relationships were strongest during certain decades. For example, the 1950s composition of Spence Field is most related to the 1950s composition of other balds.

When the summed species lists are compared (Table 8), the coefficients of community range from 39.30 (Andrews and Parsons) to 61.30 (Gregory and Parsons). The higher values are reported for balds which are geographically

Table 7. Coefficients of community for five balds at separate time periods.

	Andrews 1	Andrews 2	Andrews 3	Andrews 4	Gregory 1	Gregory 2	Gregory 3	Gregory 4	Spence 1	Spence 2	Spence 3	Spence 4	Parsons 1	Parsons 2	Parsons 4	Silers 1	Silers 2	Silers 4
Andrews 1	--	49.32	48.41	48.23	21.58	24.49	26.14	28.57	15.84	31.43	32.26	22.22	2.38	22.22	23.01	25.88	35.97	29.91
Andrews 2		--	70.66	64.90	24.16	43.31	49.08	43.27	25.23	52.00	48.48	36.76	6.38	45.52	34.15	27.37	60.40	34.19
Andrews 3			--	66.67	28.75	44.05	48.28	43.96	22.95	47.20	56.82	36.73	5.71	41.03	34.33	24.53	56.25	32.81
Andrews 4				--	25.00	40.79	35.44	40.96	22.64	46.90	48.75	47.33	4.49	37.14	35.59	24.44	43.06	39.29
Gregory 1					--	34.67	38.46	36.59	19.23	29.37	27.85	17.05	18.39	28.99	31.03	6.82	19.76	23.64
Gregory 2						--	63.41	47.67	25.00	56.95	53.01	43.80	16.84	79.45	54.84	18.75	42.67	27.12
Gregory 3							--	60.67	25.42	50.96	54.65	39.16	9.90	55.26	56.92	15.69	44.87	29.03
Gregory 4								--	22.22	44.85	52.22	42.38	16.51	40.00	55.07	18.18	43.90	48.48
Spence 1									--	32.38	28.33	24.18	8.16	24.00	25.64	20.00	32.69	27.78
Spence 2										--	62.89	47.69	11.26	54.68	46.15	24.72	55.94	31.64
Spence 3											--	48.28	11.65	43.25	43.94	19.23	50.63	31.75
Spence 4												--	10.81	40.00	38.83	18.67	43.41	39.18
Parsons 1													--	16.87	19.67	0.0	6.90	7.27
Parsons 2														--	53.57	19.05	46.38	26.42
Parsons 4															--	25.81	34.48	42.86
Silers 1																--	29.55	35.71
Silers 2																	--	47.27
Silers 4																		--

Table 8. Coefficients of community for the summed species lists for the five most studied balds.

	Coefficient of Community				
	Andrews	Gregory	Spence	Parsons	Silers
Andrews	---	50.64	56.00	39.30	54.87
Gregory		---	61.23	61.30	45.74
Spence			---	53.57	55.20
Parsons				---	43.43
Silers					---

close to one another. The lowest similarities are between Parsons Bald (the westernmost bald) and Andrews and Silers Balds (the easternmost balds in this matrix).

Thirty-one species were found on all five balds and an additional twenty-three species were found on four of the five balds (Tables 9 and 10). Andrews Bald (with 32) and Gregory Bald (with 36) had the highest number of unique species. Among the species unique to Andrews Bald are high elevation plants (e.g., Abies fraseri, Cacalia rugelia, Glyceria nubigena, Oxalis montana, Picea rubens, and Rubus idaeus var. canandensis) and wetlend plants (e.g., Carex crinita, Drosera rotundifolia, and Solidago patula). (Andrews Bald is the only one of the five balds with a seepage marsh.) Among the species unique to Gregory Bald are the rare plants already discussed, cockspur hawthorn (Crataegus crus-galli) and arrowwood (Viburnum dentatum). Table 9 serves to underscore the pathiness of plant distribution on the grassy balds--34 percent of the balds flora is found on only one of the five balds. Only 19 percent of the flora has been reported from four or more of the five balds.

DISCUSSION

The GRSM grassy balds flora is not in equilibrium. Historic photographs and research studies allow us to construct the following outline of changes in overall grassy bald floristics (see also Bruhn 1964; Gershmel 1970; Lindsay 1978);

(1) Most balds were used as upland pastures until the mid-1930s. Historic photographs show a close-cropped grass sward, low woody plant cover, and a seemingly low species richness. However, herbarium specimens

Table 9. Frequency of the GRSM balds flora: A summary for the five most studied balds.

Number of Balds of Occurrence	Number of Species	Cumulative Total Species
All 5 balds	31	31
4 balds	23	54
3 balds	36	90
2 balds	77	167
1 bald:	100	267
Andrews bald only	32	
Gregory Bald only	36	
Spence Field only	19	
Parsons Bald only	7	
Silers Bald only	6	

Table 10. Species reported for four or more of the five most studied balds.

Known from five Balds	Known from four Balds
Acer rubrum	*Achillea millefolium
*Agrostis alba	Agrostis scabra
Amelanchier laevis	Athyrium asplenoides
Betula lutea	Botrychium dissectum
Carex debilis	*Chrysanthemum leucanthemum
Carex normalis	Cuscuta rostrata
Carex pensylvanica	Epigaea repens
Crataegus macrosperma	Gentiana decora
Danthonia compressa	Hieracium paniculatum
Danthonia spicata	Hieracium scabrum
Dennstaedtia punctilobula	Lilium superbum
Fagus grandifolia	Lyonia ligustrina
Fragaria virginica	Oxydendrum arboreum
Houstonia purpurea	Pinus pungens
Houstonia serpyllifolia	Prenanthes trifoliata
Juncus tenuis	Quercus rubra
Kalmia latifolia	Rhododendron calendulaceum
Lysimachia quadrifolia	Sambucus canadensis
Luzula echinata	Smilax rotundifolia
*Phleum pratense	Solidago arguta
Potentilla canadensis	Solidago bicolor
Prunella vulgaris	Sorbus americana
Prunus pensylvanica	Vaccinium vacillans (incl. some V. pallens)
Rhododendron catawbiense	
Rubus canadensis	
*Rumex acetosella	
Solidago spp.	
Stachys clingmanii	
Vaccinium constablaei	
Viola spp.	
Viola sagittata	

*Exotic species

document the presence of a fair diversity in the 1930s, including 31 woody species.

(2) Termination of grazing resulted in local increases in plant populations, and an increasing dominance by woody plants. The increase in woody plant cover became obvious in the 1940s and 1950s and continues to the present. Both a real and an apparent increase in species richness was noted during this period: real in the sense that species have invaded and continue to invade balds from surrounding forest, and apparent in the sense that species already present on the balds flowered more vigorously and increased local population size. For example, herbarium specimens show that blueberries (Vaccinium), hawthorns (Crataegus), and other woody plant "invaders" of the balds were already present on most balds in the 1930s, although they became more important after grazing stopped.

(3) Completion of shrub and tree cover is now under way on the balds. This stage is ongoing. From studies of balds and the surrounding forest (P. White, unpublished data), we can hypothesize the following trends: (a) Loss of light-demanding species through successional competition and the creation of a woody plant cover; (b) a continued gain of forest habitat species from surrounding forests (note, however, that forest understory species are often conservative in reproductive strategy and hence slow to invade new areas); and (c) a decline in flowering displays (most of the showy flowering species are characteristic of the open bald and not forest understories). Because the species loss on balds will outweigh the gain of forest habitat species (the forest species richness around the balds is lower than the richness of the balds themselves) and because the gain of species is likely to be slower than the loss, it is likely there will be a net decrease

in local species richness as succession proceeds on the balds. This is one of the reasons why the National Park Service has proposed managing two of the grassy balds (Andrews and Gregory) as open or semi-open areas.

These trends suggest that peak diversity and peak flowering displays on grassy balds occurred in the 1950s to 1960s period. Livestock grazing itself, though the historic agent that kept balds open (Lindsay and Bratton 1976), retarded flowering displays and kept species richness at a moderate level. The period between grazing pressure and complete woody plant cover has been unique for its flowering displays and species richness. Judging from the data available, this period will have lasted in GRSM from ca 1930-2020, if present trends continue. However, the peak of flowering displays probably occurred early in the successional period and are now in a decline phase. A similar time course has been noted for balds at Craggy Gardens along the Blue Ridge Parkway (G. Smathers, personal communication).

Given this history and dynamics, it is not surprising that the grassy balds flora is patchily distributed in both time and space. There are three reasons for this heterogeneity. (1) Each bald possesses different elevational, geographic, and habitat elements. Andrews Bald, for example, has a number of distinctive species because it is the highest elevation bald, it is contiguous to spruce-fir forest, and it contains a unique wetland habitat. As previously shown, the balds tend to be most similar in total floristic composition to those balds that are geographically near. (2) The balds are continuing to gain and lose species as succession proceeds. (3) Each bald probably had a somewhat different disturbance history. For instance, there are no obvious environmental reasons why Gregory Bald should be the most diverse of the balds, nor why it should possess the highest total of unique species. Historic factors particular to Gregory Bald probably are involved.

The grassy balds are island-like habitats, both because they occupy mountain summits and because they are open habitats surrounded by closed forest. This led us to test the hypothesis that the balds flora fits the principles of island biogeography (MacArthur and Wilson 1967; Johnson 1975). These principles suggest a dynamic equilibrium of invasion and extirpation such that species richness is predictable from island size. The available data from the five most studied balds in GRSM, however, show no clear relationship between bald area and species richness. Neither could we uncover such a relationship for the past time periods. Although the data show changes in the species composition through time, these changes cannot be explained by the equilibrium model of island biogeography. Non-equilibrium forces, such as release from grazing or succession, probably are more important.

It is likely that some of the species flux between time periods is more apparent than real, and some of the heterogeneity between balds at a given time period may also be attributable to sampling error. The 1930s data are based on herbarium collections and short lists for individual balds found in Wells (1937). The 1970s data are based on ecological subsampling of the balds, although herbarium specimens also contribute to the lists. Data for the 1950s and 1960s included complete floristic inventories for five balds, ecological sampling, and some herbarium records. One of the conclusions from this analysis is that, despite the long history of balds research, certainty can only be gained through further permanent plot establishment. The data available in the literature are strong in terms of community composition and succession; they are weak in terms of total floristics and rare plant distributions. The use of permanent plots for complete

floristic inventories of selected grassy balds at 10- or 20-year intervals would aid our understanding of changes in species composition through time.

Despite this uncertainty, two real extirpations probably have occurred on grassy balds: the loses of Bicknell's rock rose (Helianthemum bicknellii) and mountain avens (Geum radiatum) from Gregory Bald are attributed to habitat change on that bald. The hybrid azalea complex, including the parental types Cumberland azalea (Rhododendron bakeri) and mountain clammy azalea (R. viscosum var. montanum), are also threatened by continued succession. This azalea complex may be as much the result of human disturbance (in terms of bald expansion) as it is threatened by indirect anthropogenic disturbance (through continued succession). In addition, dwarf gray willow (Salix humilis var. microphylla) is a final taxon whose presence in GRSM is dependent on preventing grassy bald succession. The proposed management of Gregory Bald, providing it is done with the autecology of these species in mind, should prevent any further extirpation in GRSM due to grassy bald succession.

Other grassy balds rare plants are known from other native, non-grassy balds habitats. In fact, several of these plants may now be found in "abnormally" large populations due to the expansion of open grassy habitats in the 1800s. These include: Smoky Mountain manna grass (Glyceria nubigena); a GRSM endemic also spreading along the Clingmans Dome road, rough hawkweed (Hieracium scabrum), mountain St. Johnswort (Hypericum graveolens), Mitchell's St. Johnswort (Hypericum mitchellianum), purple fringed orchid (Platanthera psychodes), Roan's rattlesnake root (Prenanthes roanensis), and Clingmans rough hedgenettle (Stachys clingmanii).

CONCLUSIONS

1. The grassy balds, despite occupying only ca .015 percent of the GRSM landscape, support 293 species of vascular plants (24% of the GRSM flora.)

2. Of 15 rare GRSM plants found on grassy balds, only the following taxa are restricted to grassy balds in GRSM: Helianthemum bicknellii, Rhododendron bakeri, Rhododendron viscosum var. montanum, the Rhododendron-hybrid complex of Gregory Bald, and Salix humilis var. microphylla.

3. The park's grassy bald flora is patchily distributed. This heterogeneity means that managing only a few of the balds will result in species loss from the balds flora. However, Gregory Bald is the most diverse bald and has the highest number of rare species; management of Gregory Bald will remove any known threat of extirpation due to woody plant succession.

4. Population monitoring of rare species will be required to be certain of future floristic change. The available data base allows overall patterns to be determined, but has several sources of sampling error.

5. The species/area relationship for the five most studied balds does not show insularity in the sense of MacArthur and Wilson (1967).

6. The peak flowering display on grassy balds probably occurred 20-40 years after grazing ceased. Peak species richness occurred ca 20-60 years after grazing ceased.

7. Two extirpations apparently have occurred on GRSM grassy balds: Helianthemum bicknellii and Geum radiatum. Geum radiatum, however, is extant in GRSM at a non-grassy bald locale.

8. Although a number of endemic species are found on grassy balds, only Rhododendron bakeri, Rhododendron viscosum var. montanum, and the hybrid

azalea complex are limited to the balds. The flora is unrelated to the above-treeline alpine floras of New England and farther north. The composition of the grassy bald flora itself lends little support to theories of a natural origin for the gasssy balds. Species unique to the balds form only a small part of the GRSM balds flora; furthermore, these species are present only on three of the eighteen balds discussed here.

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APPENDIX I

THE GRSM GRASSY BALD FLORA

Sources of records are given in the text.

Abbreviations;

"OBS" = species number in Appendix tables.

"Species" = 6-letter species code used in GRSM computer programs

Balds are identified as:

"A" = Andrews Bald

"G" = Gregory Bald

"Sp" = Spence Field

"P" = Parsons Bald

"S" = Silers Bald

"R" = Russell Field

"T" = Thunderhead Mountain

"H" = Hemphill Bald

"LG" = Ledge Bald

"L" = Little Bald

"MS" - Mount Sterling

Time Periods:

1 = 1930-1945

2 = 1950-1960

3 = 1960-1970

4 = 1970-present

Presence = "1" in the data matrix

Absence = "." in the data matrix

TYPE=FERNS

OBS	SPEC	NAME	AA1	AA2	AA3	AA4	GG1	GG2	GG3	GG4	SP1	SP2	SP3	SP4	PP1	PP2	PP4	SS1	SS2	SS4	RR1	RR2	RR4	TT1	TT2	TT4	HH1	HH2	HH4	LG1	LG2	LG4	LL1	LL2	LL4	MS1	MS2	MS4
1	ATHASP	ATHYRIUM ASPLENIOIDES	.	.	.	1	.	1	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
2	BTRDSS	BOTRYCHIJM DISSECTUM	.	.	.	.	1	1	.	1	1	.	1	1	1	1	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
3	DNNPNC	DENNSTAEDTIA PUNCTILOBULA	1	1	1	1	.	1	1	1	.	1	1	1	.	1	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
4	DRPINT	DRYOPTERIS INTERMEDIA	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	LYCLCD	LYCOPODIUM LJCIDULUM	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	OSMCNN	OSMUNDA CINNAMOMEA	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
7	OSMCLT	OSMUNDA CLAYTONIANA	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
8	PLPVRG	POLYPODIUM VIRGINIANUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9	PLSACR	POLYSTICHUM ACROSTICHOIDES	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10	PTDAQL	PTERIDIUM AQUILINUM	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	THYNVB	THELYPTERIS NOVEBORACENSIS	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TYPE=HERBS

OBS	SPEC	NAME	AA1	AA2	AA3	AA4	GG1	GG2	GG3	GG4	SP1	SP2	SP3	SP4	PP1	PP2	PP4	SS1	SS2	SS4	RR1	RR2	RR4	TT1	TT2	TT4	HH1	HH2	HH4	LG1	LG2	LG4	LL1	LL2	LL4	MS1	MS2	MS4
12	ACHMLL	ACHILLEA MILLEFOLIUM	.	.	0	.	.	1	1	1	.	1	1	1	1	1	1	.	1	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
13	AGLPRP	AGALINIS PURPUREA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
14	AGNRPN	AGROPYRON REPENS	.	.	1	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15	AGSALB	AGROSTIS ALBA	1	1	1	1	.	1	1	1	1	1	1	.	.	1	1	1	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16	AGSPRN	AGROSTIS PERENNANS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
17	AGSSCB	AGROSTIS SCABRA	.	.	1	.	.	1	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
18	AGSTNS	AGROSTIS TENUIS	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
19	AMBART	AMBROSIA ARTEMISIIFOLIA	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
20	AMTMSC	AMIANTHIUM MUSCAETOXICUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
21	ANDSCP	ANDROPOGON SCOPARIUS	.	.	.	.	.	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
22	ANMQNQ	ANEMONE QUINQUEFOLIA	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
23	ANGTRQ	ANGELICA TRIQUINATA	.	1	1	1	.	.	.	.	.	1	1	1	.	.	.	.	1	.	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
24	ANTPLN	ANTENNARIA PLANTAGINIFOLIA	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
25	AQLCND	AQUILEGIA CANADENSIS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
26	ARCMNS	ARCTIUM MINUS	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
27	ASCTBR	ASCELPIAS TUBEROSA	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
28	ASCEXL	ASCLEPIAS EXALTATA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
29	ASTACM	ASTER ACUMINATUS	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
30	ASTCRD	ASTER CORDIFOLIUS	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
31	ASTCRT	ASTER CURTISII	.	1	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
32	ASTDVR	ASTER DIVARICATUS	1	1	1	1	.	1	.	.	.	1	1	1	.	1	.	1	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
33	ASTLTR	ASTER LATERIFLORUS	.	.	.	.	.	1	.	.	1	.	1	1	.	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
34	ASTLWR	ASTER LOWRIEANUS	.	1	1	1	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
35	ASTOBL	ASTER OBLONGIFOLIUS	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
36	ASTPTN	ASTER PATENS	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TYPE=HERBS

OBS	SPECIES	NAME	A1	A2	A3	A4	G1	G2	G3	G4	SP1	SP2	SP3	SP4	P1	P2	P4	S1	S2	S4	R1	R2	R4	T1	T2	T4	H1	H2	H4	LG1	LG2	LG4	L1	L2	L4	MS1	MS2	MS4
37	ASTPLS	ASTER PILOSUS	.	.	.	.	.	.	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
38	ASTPNC	ASTER PUNICEUS	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
39	ASTSRC	ASTER SURCULOSUS	.	.	.	.	1	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
40	ASTUND	ASTER UNDULATUS	.	.	1	.	.	1	1	1	.	.	1	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
41	BPTTNC	BAPTISIA TINCTORIA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
42	BRTVRG	BARTONIA VIRGINICA	.	1	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
43	CCLRGL	CACALIA RUGELIA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
44	CMPDVR	CAMPANULA DIVARICATA	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
45	CRXAST	CAREX AESTIVALIS	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
46	CRXART	CAREX ARTITECTA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
47	CRXBRN	CAREX BRUNNESCENS	.	.	.	.	1	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
48	CRXCMM	CAREX COMMUNIS	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
49	CRXCRN	CAREX CRINITA	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.
50	CRXDBL	CAREX DEBILIS	1	1	1	1	.	1	1	1	.	1	1	1	.	1	1	1	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1	.	.
51	CRXINT	CAREX INTUMESCENS	.	1	1	1	.	.	.	.	.	1	1	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
52	CRXLPN	CAREX LEPTONERVIA	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
53	CRXMSR	CAREX MISERA	.	.	1	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
54	CRXNRM	CAREX NORMALIS	1	1	1	1	1	1	1	1	.	1	1	.	.	1	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
55	CRXPNS	CAREX PENSYLVANICA	1	1	.	1	.	.	.	1	.	.	.	1	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
56	CRXRDT	CAREX RADIATA	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
57	CRXROS	CAREX ROSEA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
58	CRXRTH	CAREX RUTHII	.	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
59	CRXSCP	CAREX SCOPARIA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
60	CRXSTP	CAREX STIPATA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
61	CRXSWN	CAREX SWANII	.	.	.	.	1	.	1	1	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
62	CRXTRB	CAREX TRIBULOIDES	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
63	CRXVLP	CAREX VULPINOIDEA	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
64	CSLCCC	CASTILLEJA COCCINEA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
65	CERHLS	CERASTIUM HOLOSTEIOIDES	.	.	.	.	.	.	.	1	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.
66	CERARV	CERASTIUM SP.	.	1	.	.	.	.	.	.	.	1	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
67	CERVSC	CERASTIUM VISCOSUM	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
68	CHYLCN	CHRYSANTHEMUM LEUCANTHEMUM	.	1	.	.	1	1	1	1	.	1	1	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.
69	CHSMRN	CHRYSOPSIS MARIANA	.	.	.	.	.	1	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
70	CRSMTC	CIRSIUM MUTICUM	.	.	1	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
71	CRSVLG	CIRSIUM VULGARE	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
72	CLTCRL	CLAYTONIA CAROLINIANA	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
73	CNTBRL	CLINTONIA BOREALIS	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
74	CNTUMB	CLINTONIA UMBELLULATA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
75	CNPAMR	CONOPHOLIS AMERICANA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
76	CRPMJR	COREOPSIS MAJOR	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
77	CSCRST	CUSCUTA ROSTRATA	1	.	.	1	.	.	.	1	.	.	1	1	.	.	.	.	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
78	DCTGLM	DACTYLIS GLOMERATA	.	.	1	.	.	.	1	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
79	DTHCMP	DANTHONIA COMPRESSA	1	1	1	1	1	1	1	1	1	1	1	1	.	1	1	1	1	1	.	.	1	1	.	1	.	.	1	1	.	.	.	1	.	.	.	.
80	DTHSPC	DANTHONIA SPICATA	.	.	.	1	.	1	.	1	.	1	.	1	.	.	1	.	.	1	.	.	1	.	.	1	.	.	1	.	.	.	.	.	1	.	.	.
81	DCSCRT	DAUCUS CAROTA	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
82	DRSRTN	DROSERA ROTUNDIFOLIA	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
83	EPGRPN	EPIGAEA REPENS	.	1	1	1	.	1	1	1	.	.	1	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
84	ERRSPC	ERAGROSTIS SPECTABILIS	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TYPE=HERBS

OBS	SPEC	NAME	AA1	AA2	AA3	AA4	GG1	GG2	GG3	GG4	SPP1	SPP2	SPP3	SPP4	PP1	PP2	PP4	SS1	SS2	SS4	RR1	RR2	RR4	TT1	TT2	TT4	HH1	HH2	HH4	LGG1	LGG2	LGG4	LL1	LL2	LL4	MSS1	MSS2	MSS4
85	ERGSTR	ERIGERON STRIGOSUS	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
86	HLNDCP	ERIGERON STRIGOSUS	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
87	ERYAMR	ERYTHRONIUM AMERICANUM	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
88	EPTFST	EUPATORIUM FISTULOSUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
89	EPTPRP	EUPATORIUM PURPUREUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
90	EPTRGS	EUPATORIUM RUGOSUM	.	.	.	.	.	.	1	1	.	1	1	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
91	FRGVRG	FRAGARIA VIRGINIANA	1	1	.	.	1	1	1	.	1	.	.	.	1	1	1	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
92	GLM	GALIUM SPP.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
93	GLTPRC	GAULTHERIA PROCUMBENS	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
94	GNTDCR	GENTIANA DECORA	1	1	1	1	1	1	.	1	.	.	1	.	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
95	GNTQNQ	GENTIANA QUINQUEFOLIA	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
96	GRNMCL	GERANIUM MACULATUM	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
97	GEMRDT	GEUM RADIATUM	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
98	GLYMLC	GLYCERIA MELICARIA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
99	GLYNBG	GLYCERIA NUBIGENA	1	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
100	GNPPRP	GNAPHALIUM PURPUREUM	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
101	GDYRPN	GOODYERA REPENS	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
102	HDMPLG	HEDEOMA PULEGIOIDES	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.
103	HLTBCK	HELIANTHEMUM BICKNELLII	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
104	HLNDCP	HELIANTHUS DECAPETALUS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
105	HLNDVR	HELIANTHUS DIVARICATUS	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
106	HCHAMR	HEUCHERA AMERICANA	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
107	HCHVLL	HEUCHERA VILLOSA	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
108	HRMFLR	HIERACIUM FLORENTINUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
109	HRMPNC	HIERACIUM PANICULATUM	1	1	1	1	.	.	1	1	.	1	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
110	HRMPRT	HIERACIUM PRATENSE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
111	HRMSCB	HIERACIUM SCABRUM	.	.	1	.	.	.	1	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
112	HLCLNT	HOLCUS LANATUS	.	.	.	.	1	.	1	.	.	1	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.
113	HSTPRP	HOUSTONIA PURPUREA	1	1	1	1	1	1	1	1	.	1	1	.	.	1	1	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
114	HSTSRP	HOUSTONIA SERPYLLIFOLIA	1	1	1	1	1	1	1	1	.	1	1	1	.	1	1	1	1	1	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
115	HYPGRV	HYPERICUM GRAVEOLENS	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
116	HYPMTC	HYPERICUM MITCHELLIANUM	1	1	1	1	.	.	.	.	1	1	.	.	.	.	.	1	1	1	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.
117	HYPPNC	HYPERICUM PUNCTATUM	.	.	.	.	.	.	1	1	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.
118	HYTPTL	HYSTRIX PATULA	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
119	JNCACM	JUNCUS ACUMINATUS	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
120	JNCEFF	JUNCUS EFFUSUS	.	1	1	1	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
121	JNCMRG	JUNCUS MARGINATUS	1	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
122	JNCTNS	JUNCUS TENUIS	.	1	1	1	1	1	1	1	1	1	1	.	.	1	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.
123	KRGBFL	KRIGIA BIFLORA	.	.	.	.	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
124	KRGVRG	KRIGIA VIRGINICA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
125	LTCCND	LACTUCA CANADENSIS	.	.	.	.	.	.	.	.	1	.	.	1	1	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.
126	LCHRCM	LECHEA RACEMULOSA	.	.	.	.	1	1	1	1	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
127	LSPCPT	LESPEDEZA CAPITATA	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
128	LLMSPB	LILIUM SUPERBUM	1	1	1	1	.	.	1	1	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
129	LZLACM	LUZULA ACUMINATA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
130	LZLECH	LUZULA ECHINATA	.	.	1	1	1	.	.	1	.	1	.	.	.	.	1	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.
131	LYSQDR	LYSIMACHIA QUADRIFOLIA	.	1	1	.	.	1	1	1	.	1	1	.	.	1	1	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
132	MNHCND	MAIANTHEMUM CANADENSE	1	.	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TYPE=HERBS

OBS	SPECIES	NAME	AA1	AA2	AA3	AA4	AG1	AG2	AG3	AG4	SP1	SP2	SP3	SP4	PP1	PP2	PP4	SS1	SS2	SS4	RR1	RR2	RR4	TT1	TT2	TT4	HH1	HH2	HH4	LG1	LG2	LG4	LL1	LL2	LL4	MS1	MS2	MS4
133	MLXJNF	MALAXIS UNIFOLIA	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
134	MDLVRG	MEDEOLA VIRGINIANA	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
135	MNRDDY	MONARDA DIDYMA	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
136	MNRFST	MONARDA FISTULOSA	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
137	MTPUNF	MONOTROPA UNIFLORA	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
138	ONTTTR	OENOTHERA TETRAGONA	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
139	ORCSPC	ORCHIS SPECTABILIS	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
140	OXLMNT	OXALIS MONTANA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
141	OXLSTR	OXALIS STRICTA	.	.	.	.	1	.	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
142	OXPRGD	OXYPOLIS RIGIDIOR	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
143	PNCOMM	PANICUM COMMUTATUM	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
144	PNCLNG	PANICUM LANUGINOSUM	.	.	.	.	.	.	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
145	PNCPHL	PANICUM PHILADELPHICUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
146	PRCQNQ	PARTHENOCISSUS QUINQUEFOLIA	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
147	PDCCND	PEDICULARIS CANADENSIS	.	.	.	.	.	.	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
148	PHMPRT	PHLEUM PRATENSE	1	.	1	.	.	1	1	1	1	1	1	.	.	.	1	.	1	1	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	1	.	.
149	PHXCRL	PHOLX CAROLINA	.	1	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
150	PLNLNC	PLANTAGO LANCEOLATA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
151	PLTCLR	PLATANTHERA CILIARIS	.	.	.	.	.	1	.	1	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
152	PLTCLV	PLATANTHERA CLAVELLATA	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
153	PLTPSY	PLATANTHERA PSYCODES	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
154	POACMP	POA COMPRESSA	.	.	.	.	.	1	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
155	POACSP	POA CUSPIDATA	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
156	POAPRT	POA PRATENSIS	1	1	1	.	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
157	PLYAVC	POLYGONUM AVICULARE	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
158	PLYCLN	POLYGONUM CILINODE	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.
159	PLYPRS	POLYGONUM PERSICARIA	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
160	PLYSCN	POLYGONUM SCANDENS	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
161	PTNCND	POTENTILLA CANADENSIS	1	1	1	1	.	1	1	1	1	1	1	.	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
162	PTNNRV	POTENTILLA NORVEGICA	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
163	PTNSMP	POTENTILLA SIMPLEX	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
164	PNNALT	PRENANTHES ALTISSIMA	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
165	PNNRNN	PRENANTHES ROANENSIS	1	.	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
166	PNNTRF	PRENANTHES TRIFOLIOLATA	.	1	1	1	.	1	1	1	.	.	.	.	.	1	.	.	1	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
167	PNLVLG	PRUNELLA VULGARIS	1	1	1	.	.	1	1	1	.	1	1	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
168	PYCMNT	PYCNANTHEMUM MONTANUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
169	RNNHSP	RANUNCULUS HISPIDUS	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
170	RBSALL	RUBUS ALLEGHENIENSIS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
171	RBSCND	RUBUS CANADENSIS	.	1	1	1	.	1	1	1	.	1	1	1	.	1	1	1	1	1	.	.	1	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.
172	RBSIDS	RUBUS IDAEUS	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
173	RDBHRT	RUDBECKIA HIRTA	.	.	.	.	1	.	1	1	1	1	.	.	.	.	.	.	.	1	.	.	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.
174	RDBLCN	RUDBECKIA LACINIATA	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
175	RMXACT	RUMEX ACETOSELLA	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	.	1	1	.	.	1	1	.	1	.	.	1	.	.	.	.	.	.	1	.	.
176	RMXOBT	RUMEX OBTUSIFOLIUS	.	.	.	.	.	.	1	1	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
177	SNCSML	SENECIO SMALLII	.	.	.	.	1	1	1	.	.	1	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
178	SLNSTL	SILENE STELLATA	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
179	SLNVRG	SILENE VIRGINICA	.	.	.	.	1	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
180	SSRANG	SISYRINCHIUM ANGUSTIFOLIUM	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.

TYPE=HERBS

OBS	SPECIES	NAME	AA1	AA2	AA3	AA4	AG1	AG2	AG3	AG4	SP1	SP2	SP3	SP4	PP1	PP2	PP4	SS1	SS2	SS4	RR1	RR2	RR4	TT1	TT2	TT4	HH1	HH2	HH4	LG1	LG2	LG4	LL1	LL2	LL4	MS1	MS2	MS4
181	SMLRCM	SMILACINA RACEMOSA	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
182	SMXHRB	SMILAX HERBACEA	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
183	SLMCRL	SOLANUM CAROLINENSE	.	.	.	.	.	1	.	1	.	1	.	1	1	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
184	SLDARG	SOLIDAGO ARGUTA	.	1	1	.	.	.	1	1	.	.	1	.	.	.	.	.	1	.	.	.	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.
185	SLDBCL	SOLIDAGO BICOLOR	.	1	.	.	.	.	1	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.
186	SLDCRT	SOLIDAGO CURTISII	.	.	.	.	.	.	.	1	.	1	1	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
187	SLDGLM	SOLIDAGO GLOMERATA	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
188	SLDODR	SOLIDAGO ODORA	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
189	SLDPTL	SOLIDAGO PATULA	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
190	SLDPBR	SOLIDAGO PUBERULA	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
191	SLDRNN	SOLIDAGO ROANENSIS	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
192	SLD	SOLIDAGO SPP.	1	1	1	1	.	.	1	1	1	1	1	1	.	.	1	1	1	1	.	.	1	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.
193	SGHNTN	SORGHASTRUM NUTANS	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
194	SPCPRF	SPECULARIA PERFOLIATA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
195	SPTCRN	SPIRANTHES CERNUA	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
196	STCCLN	STACHYS CLINGMANII	.	1	1	.	.	.	1	1	1	.	1	1	.	.	1	.	1	1	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
197	STCLTD	STACHYS LATIDENS	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
198	STLMED	STELLARIA MEDIA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
199	STLPBR	STELLARIA PUBERA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
200	STNGRM	STENANTHIUM GRAMINEUM	1	1	1	1	1	.	1	1	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
201	TRXOFF	TARAXACUM OFFICINALE	.	.	.	.	.	.	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
202	THLPLY	THALICTRUM POLYGAMUM	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
203	THLRVL	THALICTRUM REVOLUTUM	.	.	1	.	1	.	.	1	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
204	THSTRF	THASPIUM TRIFOLIATUM	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
205	TRDSBS	TRADESCANTIA SUBASPERA	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
206	TRVCRL	TRAUTVETTERIA CAROLINIENSIS	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
207	TRFPRT	TRIFOLIUM PRATENSE	.	.	.	.	1	1	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
208	TRFRPN	TRIFOLIUM REPENS	.	.	.	.	1	1	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
209	TRLGRN	TRILLIUM GRANDIFLORUM	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
210	TRSARN	TRIOSTEUM AURANTIACUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
211	VRBBLT	VERBASCUM BLATTARIA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
212	VRBTHP	VERBASCUM THAPSUS	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
213	VRNARV	VERONICA ARVENSIS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
214	VRNOFF	VERONICA OFFICINALIS	.	.	.	.	1	.	.	1	1	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
215	VIOEMR	VIOLA EMARGINATA	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
216	VIOFBM	VIOLA FIMBRIATULA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
217	VIOHST	VIOLA HASTATA	.	.	.	.	.	.	.	1	.	.	.	1	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
218	VIOINC	VIOLA INCOGNITA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
219	VIOLTS	VIOLA LATIUSCULA	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
220	VIOMCL	VIOLA MACLOSKEYI	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
221	VIOPDT	VIOLA PEDATA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
222	VIOPRM	VIOLA PRIMULIFOLIA	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
223	VIORTN	VIOLA ROTUNDIFOLIA	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
224	VIOSGT	VIOLA SAGITTATA	.	1	.	.	1	1	1	.	1	1	.	.	1	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
225	VIOSRR	VIOLA SORORIA	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
226	VIO	VIOLA SPP.	1	1	1	1	1	1	1	1	1	1	1	1	.	1	1	.	1	1	1	.	1	.	.	1	.	.	1	.	.	.	1	.	1	1	.	.	.
227	WLDFRG	WALDSTEINIA FRAGARIOIDES	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TYPE=WOODY

OBS	SPECIES	NAME	AA1	AA2	AA3	AA4	GG1	GG2	GG3	GG4	SP1	SP2	SP3	SP4	PP1	PP2	PP4	SS1	SS2	SS4	RR1	RR2	RR4	TT1	TT2	TT4	HH1	HH2	HH4	LG1	LG2	LG4	LL1	LL2	LL4	MS1	MS2	MS4
228	ABSFRS	ABIES FRASERI	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
229	ACRPNS	ACER PENSYLVANICUM	.	.	.	.	1	1	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
230	ACRRBR	ACER RUBRUM	.	1	1	1	.	1	1	.	.	1	1	1	.	1	.	.	1	.	1	.	1	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.
231	ACRSCR	ACER SACCHARUM	.	.	.	1	.	1	.	1	.	1	.	1	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
232	AESOCT	AESCULUS OCTANDRA	.	.	.	.	.	.	.	.	1	1	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
233	AMLLVS	AMELANCHIER LAEVIS	.	1	1	1	.	1	1	.	1	1	1	1	.	1	1	.	1	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.
234	ARLSPN	ARALIA SPINOSA	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
235	ARNMLN	ARONIA MELANOCARPA	.	.	.	.	1	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
236	ASMHYP	ASCYRUM HYPERICOIDES	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
237	BTLLNT	BETULA LENTA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
238	BTLLUT	BETULA LUTEA	.	1	1	1	.	1	1	.	.	1	1	1	.	1	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.
239	CSTDNT	CASTANEA DENTATA	.	.	.	.	.	1	1	.	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240	CRNFLD	CORNUS FLORIDA	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
241	CRTCRS	CRATAEGUS CRUS-GALLI	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
242	CRTMCR	CRATAEGUS MACROSPERMA	.	1	1	1	1	1	1	1	1	1	1	1	.	1	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
243	DRVSSS	DIERVILLA SESSILIFOLIA	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
244	DSPVRG	DIOSPYROS VIRGINIANA	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
245	FGSGRN	FAGUS GRANDIFOLIA	.	1	1	1	1	1	.	.	1	1	1	1	.	1	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
246	FRXAMR	FRAXINUS AMERICANA	.	.	1	1	.	1	.	.	.	1	1	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
247	GYLBCC	GAYLUSSACIA BACCATA	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
248	GYLURS	GAYLUSSACIA URSINA	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
249	HMMVRG	HAMAMELIS VIRGINIANA	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
250	ILXMNT	ILEX MONTANA	1	1	1	.	1	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
251	ILXOPC	ILEX OPACA	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
252	JNPVRG	JUNIPERUS VIRGINIANA	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
253	KLMLTF	KALMIA LATIFOLIA	.	1	1	.	.	1	1	.	.	1	1	1	.	1	.	.	1	.	.	.	1	.	.	1	.	.	.	.	.	.	.	1	.	1	.	.
254	LRDTLP	LIRIODENDRON TULIPIFERA	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
255	LYNLGS	LYONIA LIGUSTRINA	.	1	1	1	1	1	1	1	.	.	1	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
256	MGNACM	MAGNOLIA ACUMINATA	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
257	MGNFRS	MAGNOLIA FRASERI	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
258	OXYARB	OXYDENDRUM ARBOREUM	.	.	.	.	.	1	1	.	.	1	1	1	.	1	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
259	PICRBN	PICEA RUBENS	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
260	PNSPNG	PINUS PUNGENS	.	.	1	.	.	1	1	.	.	.	1	.	.	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
261	PNSRGD	PINUS RIGIDA	.	.	.	.	.	1	1	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
262	PNSSTR	PINUS STROBUS	.	.	.	.	.	1	1	.	.	1	1	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
263	PRNPNS	PRUNUS PENSYLVANICA	.	1	1	1	.	1	.	1	.	1	1	1	.	1	1	.	1	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
264	PRNSRT	PRUNUS SEROTINA	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
265	QRCALB	QUERCUS ALBA	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
266	QRCRBR	QUERCUS RUBRA	.	1	1	1	1	1	1	1	.	1	1	.	1	1	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
267	RHMCPL	RHAMNUS CAROLINIANA	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
268	RHDARB	RHODODENDRON ARBORESCENS	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
269	RHDBKR	RHODODENDRON BAKERI	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
270	RHDCLN	RHODODENDRON CALENDULACEUM	1	1	1	1	1	1	1	1	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
271	RHDCTW	RHODODENDRON CATAWBIENSE	1	1	1	1	.	1	.	.	.	1	.	1	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
272	RHDMXM	RHODODENDRON MAXIMUM	.	.	1	1	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
273	RHDNDF	RHODODENDRON NUDIFLORUM	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
274	RHDVSC	RHODODENDRON VISCOSUM	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
275	RHSCPL	RHUS COPALLINA	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TYPE=WOODY

OBS	SPECIES	NAME	AA1	AA2	AA3	AA4	GG1	GG2	GG3	GG4	SP1	SP2	SP3	SP4	PP1	PP2	PP4	SS1	SS2	SS4	RR1	RR2	RR4	TT1	TT2	TT4	HH1	HH2	HH4	LG1	LG2	LG4	LL1	LL2	LL4	MS1	MS2	MS4
276	RHSRDC	RHUS RADICANS	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
277	RIBRTN	RIBES ROTUNDIFOLIUM	1	1	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
278	SLXHML	SALIX HUMILIS	.	.	1	.	1	1	1	1	.	.	1	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
279	SMBCND	SAMBUCUS CANADENSIS	.	.	.	.	.	1	.	.	1	1	1	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
280	SMXRTN	SMILAX ROTUNDIFOLIA	.	.	.	.	.	.	1	1	.	1	1	.	.	1	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
281	SRBAMR	SORBUS AMERICANA	.	1	1	1	.	.	.	1	.	1	1	.	.	.	.	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
282	TILHTR	TILIA HETEROPHYLLA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
283	TSGCND	TSUGA CANADENSIS	.	.	.	.	.	1	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
284	VCCCNS	VACCINIUM CONSTABLAEI	1	1	.	1	1	1	.	.	.	1	1	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
285	VCCERY	VACCINIUM ERYTHROCARPUM	.	1	1	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
286	VCCHRS	VACCINIUM HIRSUTUM	.	.	.	.	1	1	1	1	.	1	1	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
287	VCC	VACCINIUM SPP.	1	.	.	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
288	VCCSTM	VACCINIUM STAMINEUM	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
289	VCCVCL	VACCINIUM VACILLANS	.	.	1	1	1	1	1	1	.	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
290	VBRACR	VIBURNUM ACERIFOLIUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
291	VBRALN	VIBURNUM ALNIFOLIUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.
292	VBRCSS	VIBURNUM CASSINOIDES	1	1	1	1	.	.	.	1	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
293	VBRDNT	VIBURNUM DENTATUM	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

OBS	SPECIES	NAME	A1	A2	A3	A4
1	ATHASP	ATHYRIUM ASPLENIOIDES	0	0	0	1
2	DNNPNC	DENNSTAEDTIA PUNCTILOBULA	1	1	1	1
3	DRPINT	DRYOPTERIS INTERMEDIA	1	0	0	0
4	LYCLCD	LYCOPODIUM LUCIDULUM	0	0	0	1
5	OSMCNN	OSMUNDA CINNAMOMEA	0	0	1	0
6	PLSACR	POLYSTICHUM ACROSTICHOIDES	0	0	1	0
7	THYNVB	THELYPTERIS NOVEBORACENSIS	0	0	0	1
8	AGNRPN	AGROPYRON REPENS	0	0	1	0
9	AGSALB	AGROSTIS ALBA	1	1	1	1
10	AGSSCB	AGROSTIS SCABRA	0	0	1	0
11	AGSTNS	AGROSTIS TENUIS	1	0	0	0
12	ANGTRQ	ANGELICA TRIQUINATA	0	1	1	1
13	ANTPLN	ANTENNARIA PLANTAGINIFOLIA	1	0	0	0
14	ASTACM	ASTER ACUMINATUS	0	1	1	1
15	ASTCRD	ASTER CORDIFOLIUS	0	0	0	1
16	ASTCRT	ASTER CURTISII	0	1	0	0
17	ASTDVR	ASTER DIVARICATUS	1	1	1	1
18	ASTLWR	ASTER LOWRIEANUS	0	1	1	1
19	ASTUND	ASTER UNDULATUS	0	0	1	0
20	BRTVRG	BARTONIA VIRGINICA	0	1	0	0
21	CCLRGL	CACALIA RUGELIA	1	0	0	0
22	CMPDVR	CAMPANULA DIVARICATA	0	0	1	0
23	CRXART	CAREX ARTITECTA	1	0	0	0
24	CRXCMM	CAREX COMMUNIS	1	0	0	1
25	CRXCRN	CAREX CRINITA	1	1	1	1
26	CRXDBL	CAREX DEBILIS	1	1	1	1
27	CRXINT	CAREX INTUMESCENS	0	1	1	1
28	CRXMSR	CAREX MISERA	0	0	1	0
29	CRXNRM	CAREX NORMALIS	1	1	1	1
30	CRXPNS	CAREX PENSYLVANICA	1	1	0	1
31	CRXRDT	CAREX RADIATA	1	0	0	0
32	CRXROS	CAREX ROSEA	1	0	0	0
33	CRXRTH	CAREX RUTHII	0	1	1	1
34	CRXTRB	CAREX TRIBULOIDES	1	0	0	0
35	CERARV	CERASTIUM SP.	0	1	0	0
36	CERVSC	CERASTIUM VISCOSUM	1	0	0	0
37	CHYLCN	CHRYSANTHEMUM LEUCANTHEMUM	0	1	0	0
38	CRSMTC	CIRSIUM MUTICUM	0	0	1	0
39	CLTCRL	CLAYTONIA CAROLINIANA	0	1	0	0
40	CNTUMB	CLINTONIA UMBELLULATA	1	0	0	0
41	CNPAMR	CONOPHOLIS AMERICANA	1	0	0	0
42	CSCRST	CUSCUTA ROSTRATA	1	0	0	1
43	DCTGLM	DACTYLIS GLOMERATA	0	0	1	0
44	DTHCMP	DANTHONIA COMPRESSA	1	1	1	1
45	DTHSPC	DANTHONIA SPICATA	0	0	0	1
46	DRSRTN	DROSERA ROTUNDIFOLIA	1	1	1	1
47	EPGRPN	EPIGAEA REPENS	0	1	1	1
48	ERRSPC	ERAGROSTIS SPECTABILIS	1	0	0	0
49	HLNDCP	ERIGERON STRIGOSUS	1	0	0	0
50	ERYAMR	ERYTHRONIUM AMERICANUM	0	0	1	0
51	FRGVRG	FRAGARIA VIRGINIANA	1	1	0	0
52	GLM	GALIUM SPP.	0	0	0	1
53	GLTPRC	GAULTHERIA PROCUMBENS	0	0	1	1
54	GNTDCR	GENTIANA DECORA	1	1	1	1
55	GNTQNQ	GENTIANA QUINQUEFOLIA	0	0	1	0
56	GLYMLC	GLYCERIA MELICARIA	1	0	0	0

OBS	SPECIES	NAME	A1	A2	A3	A4
57	CLYNBG	GLYCERIA NUBIGENA	1	1	0	1
58	GDYRPN	GOODYERA REPENS	1	0	0	0
59	HLTBCK	HELIANTHEMUM BICKNELLII	0	1	0	0
60	HLNDVR	HELIANTHUS DIVARICATUS	0	1	1	0
61	HPMPNC	HIERACIUM PANICULATUM	1	1	1	1
62	HRMSCB	HIERACIUM SCABRUM	0	0	1	0
63	HSTPRP	HOUSTONIA PURPUREA	1	1	1	1
64	HSTSRP	HOUSTONIA SERPYLLIFOLIA	1	1	1	1
65	HYPGRV	HYPERICUM GRAVEOLENS	1	0	1	0
66	HYPMTC	HYPERICUM MITCHELLIANUM	1	1	1	1
67	JNCACM	JUNCUS ACUMINATUS	1	1	1	1
68	JNCEFF	JUNCUS EFFUSUS	0	1	1	1
69	JNCMRG	JUNCUS MARGINATUS	1	1	1	0
70	JNCTNS	JUNCUS TENUIS	0	1	1	1
71	LLMSPB	LILIUM SUPERBUM	1	1	1	1
72	LZLECH	LUZULA ECHINATA	0	0	1	1
73	LYSQDR	LYSIMACHIA QUADRIFOLIA	0	1	1	0
74	MNHCND	MAIANTHEMUM CANADENSE	1	0	1	1
75	MNRDDY	MONARDA DIDYMA	0	0	1	0
76	MTPUNF	MONOTROPA UNIFLORA	0	0	0	1
77	ORCSPC	ORCHIS SPECTABILIS	0	0	0	1
78	OXLMNT	OXALIS MONTANA	1	0	0	0
79	OXPRGD	OXYPOLIS RIGIDIOR	1	0	0	0
80	PHLPRT	PHLEUM PRATENSE	1	0	1	0
81	PHXCRL	PHOLX CAROLINA	0	1	0	0
82	PLTCLV	PLATANTHERA CLAVELLATA	1	1	1	1
83	PLTPSY	PLATANTHERA PSYCODES	1	0	1	1
84	POACSP	POA CUSPIDATA	1	0	0	0
85	POAPRT	POA PRATENSIS	1	1	1	0
86	PTNCND	POTENTILLA CANADENSIS	1	1	1	1
87	PNNRNN	PRENANTHES ROANENSIS	1	0	1	1
88	PNNTRF	PRENANTHES TRIFOLIOLATA	0	1	1	1
89	PNLVLG	PRUNELLA VULGARIS	1	1	1	0
90	PNNHSP	RANUNCULUS HISPIDUS	1	0	0	0
91	RBSCND	RUBUS CANADENSIS	0	1	1	1
92	RBSIDS	RUBUS IDAEUS	0	1	0	0
93	RDBLCN	RUDBECKIA LACINIATA	0	1	0	0
94	RMXACT	RUMEX ACETOSELLA	1	1	1	1
95	SLNSTL	SILENE STELLATA	0	1	0	0
96	SSRANG	SISYRINCHIUM ANGUSTIFOLIUM	1	1	1	0
97	SMXHRB	SMILAX HERBACEA	0	0	1	0
98	SLDARG	SOLIDAGO ARGUTA	0	1	1	0
99	SLDBCL	SOLIDAGO BICOLOR	0	1	0	0
100	SLDGLM	SOLIDAGO GLOMERATA	0	1	1	1
101	SLDPTL	SOLIDAGO PATULA	1	1	1	0
102	SLD	SOLIDAGO SPP.	1	1	1	1
103	SPTCRN	SPIRANTHES CERNUA	1	1	0	0
104	STCCLN	STACHYS CLINGMANII	0	1	1	0
105	STCLTD	STACHYS LATIDENS	0	0	1	0
106	STNGRM	STENANTHIUM GRAMINEUM	1	1	1	1
107	THLPLY	THALICTRUM POLYGAMUM	1	0	0	0
108	THLRVL	THALICTRUM REVOLUTUM	0	0	1	0
109	TRLGRN	TRILLIUM GRANDIFLORUM	0	0	1	0
110	VIOSGT	VIOLA SAGITTATA	0	1	0	0
111	VIOSRR	VIOLA SORORIA	1	0	0	0
112	VIO	VIOLA SPP.	1	1	1	1

OBS	SPECIES	NAME	A1	A2	A3	A4
113	ABSFRS	ABIES FRASERI	1	1	1	1
114	ACRRBR	ACER RUBRUM	0	1	1	1
115	ACRSCR	ACER SACCHARUM	0	0	0	1
116	AMLLVS	AMELANCHIER LAEVIS	0	1	1	1
117	BTLLUT	BETULA LUTEA	0	1	1	1
118	CRTMCR	CRATAEGUS MACROSPERMA	0	1	1	1
119	DRVSSS	DIERVILLA SESSILIFOLIA	1	1	1	0
120	FGSGRN	FAGUS GRANDIFOLIA	0	1	1	1
121	FRXAMR	FRAXINUS AMERICANA	0	0	1	1
122	GYLURS	GAYLUSSACIA URSINA	0	0	0	1
123	ILXMNT	ILEX MONTANA	1	1	1	0
124	KLMLTF	KALMIA LATIFOLIA	0	1	1	0
125	LYNLGS	LYONIA LIGUSTRINA	0	1	1	1
126	MGNACM	MAGNOLIA ACUMINATA	0	0	0	1
127	PICRBN	PICEA RUBENS	0	1	1	1
128	PNSPNG	PINUS PUNGENS	0	0	1	0
129	PRNPNS	PRUNUS PENSYLVANICA	0	1	1	1
130	QRCRBR	QUERCUS RUBRA	0	1	1	1
131	RHDCLN	RHODODENDRON CALENDULACEUM	1	1	1	1
132	RHDCTW	RHODODENDRON CATAWBIENSE	1	1	1	1
133	RHDMXM	RHODODENDRON MAXIMUM	0	0	1	1
134	RIBRTN	RIBES ROTUNDIFOLIUM	1	1	1	0
135	SLXHML	SALIX HUMILIS	0	0	1	0
136	SRBAMR	SORBUS AMERICANA	0	1	1	1
137	VCCCNS	VACCINIUM CONSTABLAEI	1	1	0	1
138	VCCERY	VACCINIUM ERYTHROCARPUM	0	1	1	1
139	VCC	VACCINIUM SPP.	1	0	0	1
140	VCCVCL	VACCINIUM VACILLANS	0	0	1	1
141	VBRCSS	VIBURNUM CASSINOIDES	1	1	1	1

OBS	SPECIES	NAME	G1	G2	G3	G4
1	ATHASP	ATHYRIUM ASPLENIOIDES	0	1	0	0
2	BTRDSS	BOTRYCHIUM DISSECTUM	1	1	0	1
3	DNNPNC	DENNSTAEDTIA PUNCTILOBULA	0	1	1	1
4	DRPINT	DRYOPTERIS INTERMEDIA	0	0	0	1
5	OSMCLT	OSMUNDA CLAYTONIANA	0	0	0	1
6	ACHMLL	ACHILLEA MILLEFOLIUM	0	1	1	1
7	AGSALB	AGROSTIS ALBA	0	1	1	1
8	AGSSCB	AGROSTIS SCABRA	0	1	0	0
9	AMBART	AMBROSIA ARTEMISIIFOLIA	0	1	0	0
10	ANDSCP	ANDROPOGON SCOPARIUS	0	1	1	0
11	ANMQNQ	ANEMONE QUINQUEFOLIA	0	0	0	1
12	ANTPLN	ANTENNARIA PLANTAGINIFOLIA	1	0	0	0
13	ARCMNS	ARCTIUM MINUS	0	1	0	0
14	ASCTBR	ASCLEPIAS TUBEROSA	0	1	0	0
15	ASCEXL	ASCLEPIAS EXALTATA	1	0	0	0
16	ASTCRT	ASTER CURTISII	0	0	1	1
17	ASTDVR	ASTER DIVARICATUS	0	1	0	0
18	ASTLTR	ASTER LATERIFLORUS	0	1	0	0
19	ASTLWR	ASTER LOWRIEANUS	0	0	1	0
20	ASTOBL	ASTER OBLONGIFOLIUS	1	0	0	0
21	ASTPTN	ASTER PATENS	0	0	1	0
22	ASTPLS	ASTER PILOSUS	0	0	1	1
23	ASTSRC	ASTER SURCULOSUS	1	1	1	0
24	ASTUND	ASTER UNDULATUS	0	1	1	1
25	BRTVRG	BARTONIA VIRGINICA	0	1	1	1
26	CRXBRN	CAREX BRUNNESCENS	1	0	0	0
27	CRXDBL	CAREX DEBILIS	0	1	1	1
28	CRXMSR	CAREX MISERA	1	0	0	1
29	CRXNRM	CAREX NORMALIS	1	1	1	1
30	CRXPNS	CAREX PENSYLVANICA	0	0	0	1
31	CRXRDT	CAREX RADIATA	1	0	0	0
32	CRXRTH	CAREX RUTHII	1	0	0	0
33	CRXSCP	CAREX SCOPARIA	1	0	0	0
34	CRXSTP	CAREX STIPATA	1	0	0	0
35	CRXSWN	CAREX SWANII	1	0	1	1
36	CERHLS	CERASTIUM HOLOSTEIOIDES	0	0	0	1
37	CERVSC	CERASTIUM VISCOSUM	1	0	0	0
38	CHYLCN	CHRYSANTHEMUM LEUCANTHEMUM	1	1	1	1
39	CHSMRN	CHRYSOPSIS MARIANA	0	1	0	1
40	CRSMTC	CIRSIUM MUTICUM	1	0	1	0
41	CRSVLG	CIRSIUM VULGARE	0	1	0	0
42	CNTBRL	CLINTONIA BOREALIS	0	0	0	1
43	CRPMJR	COREOPSIS MAJOR	0	0	1	1
44	CSCRST	CUSCUTA ROSTRATA	0	0	0	1
45	DCTGLM	DACTYLIS GLOMERATA	0	0	1	1
46	DTHCMP	DANTHONIA COMPRESSA	1	1	1	1
47	DTHSPC	DANTHONIA SPICATA	0	1	0	1
48	DCSCRT	DAUCUS CAROTA	0	1	0	0
49	EPGRPN	EPIGAEA REPENS	0	1	1	1
50	ERGSTR	ERIGERON STRIGOSUS	1	0	0	0
51	EPTRGS	EUPATORIUM RUGOSUM	0	0	1	1
52	FRGVRG	FRAGARIA VIRGINIANA	0	1	1	1
53	GLM	GALIUM SPP.	0	0	0	1
54	GNTDCR	GENTIANA DECORA	1	1	0	1
55	GNTQNQ	GENTIANA QUINQUEFOLIA	0	0	0	1
56	GRNMCL	GERANIUM MACULATUM	1	0	0	1

OBS	SPECIES	NAME	G1	G2	G3	G4
57	GEMRDT	GEUM RADIATUM	1	0	0	0
58	GNPPRP	GNAPHALIUM PURPUREUM	1	0	0	0
59	HLTBCK	HELIANTHEMUM BICKNELLII	1	0	0	0
60	HRMPNC	HIERACIUM PANICULATUM	0	0	1	1
61	HRMSCR	HIERACIUM SCABRUM	0	0	1	0
62	HLCLNT	HOLCUS LANATUS	1	0	1	0
63	HSTPRP	HOUSTONIA PURPUREA	1	1	1	1
64	HSTSRP	HOUSTONIA SERPYLLIFOLIA	1	1	1	1
65	HYPPNC	HYPERICUM PUNCTATUM	0	0	1	1
66	JNCEFF	JUNCUS EFFUSUS	0	0	1	1
67	JNCMRG	JUNCUS MARGINATUS	0	0	1	0
68	JNCTNS	JUNCUS TENUIS	1	1	1	1
69	KRGBFL	KRIGIA BIFLORA	1	1	1	1
70	KRGVRG	KRIGIA VIRGINICA	1	0	0	0
71	LTCCND	LACTUCA CANADENSIS	0	0	0	1
72	LCHRCM	LECHEA RACEMULOSA	1	1	1	1
73	LLMSPR	LILIUM SUPERBUM	0	0	1	1
74	LZLACM	LUZULA ACUMINATA	1	0	0	0
75	LZLECH	LUZULA ECHINATA	1	0	0	1
76	LYSQDR	LYSIMACHIA QUADRIFOLIA	0	1	1	1
77	MLXUNF	MALAXIS UNIFOLIA	0	0	0	1
78	MDLVRG	MEDEOLA VIRGINIANA	0	0	0	1
79	MNRFST	MONARDA FISTULOSA	0	0	0	1
80	ONTTTR	OENOTHERA TETRAGONA	1	0	1	0
81	OXLSTR	OXALIS STRICTA	1	0	1	1
82	PNCCMM	PANICUM COMMUTATUM	1	0	0	0
83	PNCLNG	PANICUM LANUGINOSUM	0	0	1	1
84	PDCCND	PEDICULARIS CANADENSIS	0	0	1	1
85	PHMPRT	PHLEUM PRATENSE	0	1	1	1
86	PLTCLR	PLATANTHERA CILIARIS	0	1	0	1
87	POACMP	POA COMPRESSA	0	1	1	0
88	POAPRT	POA PRATENSIS	0	1	1	0
89	PLYAVC	POLYGONUM AVICULARE	1	0	0	0
90	PLYPRS	POLYGONUM PERSICARIA	1	0	0	0
91	PTNCND	POTENTILLA CANADENSIS	0	1	1	1
92	PTNSMP	POTENTILLA SIMPLEX	0	1	0	0
93	PNNALT	PRENANTHES ALTISSIMA	0	0	1	0
94	PNNTRF	PRENANTHES TRIFOLIOLATA	0	1	1	1
95	PNLVLG	PRUNELLA VULGARIS	0	1	1	1
96	RBSCND	RUBUS CANADENSIS	0	1	1	1
97	RDBHRT	RUDBECKIA HIRTA	1	0	1	1
98	RMXACT	RUMEX ACETOSELLA	1	1	1	1
99	RMXOBT	RUMEX OBTUSIFOLIUS	0	0	1	1
100	SNCSML	SENECIO SMALLII	1	1	1	0
101	SLNSTL	SILENE STELLATA	0	0	0	1
102	SLNVRG	SILENE VIRGINICA	1	0	1	0
103	SMLRCM	SMILACINA RACEMOSA	0	0	0	1
104	SMXHRB	SMILAX HERBACEA	0	0	0	1
105	SLMCRL	SOLANUM CAROLINENSE	0	1	0	1
106	SLDARG	SOLIDAGO ARGUTA	0	0	1	1
107	SLDBCL	SOLIDAGO BICOLOR	0	0	1	0
108	SLDCRT	SOLIDAGO CURTISII	0	0	0	1
109	SLD	SOLIDAGO SPP.	0	0	1	1
110	SPCPRF	SPECULARIA PERFOLIATA	1	0	0	0
111	STCCLN	STACHYS CLINGMANII	0	0	1	1
112	STCLTD	STACHYS LATIDENS	1	0	0	0

OBS	SPECIES	NAME	G1	G2	G3	G4
113	STNGRM	STENANTHIUM GRAMINEUM	1	0	1	1
114	TRXOFF	TARAXACUM OFFICINALE	0	0	1	1
115	THLRVL	THALICTRUM REVOLUTUM	1	0	0	1
116	THSTRF	THASPIUM TRIFOLIATUM	0	0	0	1
117	TRFPRT	TRIFOLIUM PRATENSE	1	1	1	1
118	TRFRPN	TRIFOLIUM REPENS	1	1	1	1
119	VRBTHP	VERBASCUM THAPSUS	1	1	0	0
120	VRNOFF	VERONICA OFFICINALIS	1	0	0	1
121	VIOFBM	VIOLA FIMBRIATULA	1	0	0	0
122	VIOHST	VIOLA HASTATA	0	0	0	1
123	VIOINC	VIOLA INCOGNITA	1	0	0	0
124	VIOPDT	VIOLA PEDATA	1	0	0	0
125	VIORTN	VIOLA ROTUNDIFOLIA	0	0	0	1
126	VIOSGT	VIOLA SAGITTATA	1	1	1	0
127	VIO	VIOLA SPP.	1	1	1	1
128	WLDFRG	WALDSTEINIA FRAGARIOIDES	0	0	0	1
129	ACRPNS	ACER PENSYLVANICUM	0	1	1	0
130	ACRRBR	ACER RUBRUM	0	1	1	0
131	ACRSCR	ACER SACCHARUM	0	1	0	1
132	AMLLVS	AMELANCHIER LAEVIS	0	1	1	0
133	ARNMLN	ARONIA MELANOCARPA	1	0	0	0
134	BTLLNT	BETULA LENTA	0	1	0	0
135	BTLLUT	BETULA LUTEA	0	1	1	0
136	CSTDNT	CASTANEA DENTATA	0	1	1	0
137	CRTCRS	CRATAEGUS CRUS-GALLI	1	0	0	0
138	CPTMCR	CRATAEGUS MACROSPERMA	1	1	1	1
139	DSPVRG	DIOSPYROS VIRGINIANA	0	0	0	1
140	FGSGRN	FAGUS GRANDIFOLIA	1	1	0	0
141	FRXAMR	FRAXINUS AMERICANA	0	1	0	0
142	GYLBCC	GAYLUSSACIA BACCATA	1	0	0	0
143	ILXMNT	ILEX MONTANA	1	0	0	0
144	ILXOPC	ILEX OPACA	0	0	1	0
145	KLMLTF	KALMIA LATIFOLIA	0	1	1	0
146	LRDTLP	LIRIODENDRON TULIPIFERA	0	1	0	0
147	LYNLGS	LYONIA LIGUSTRINA	1	1	1	1
148	OXYARB	OXYDENDRUM ARBOREUM	0	1	1	0
149	PNSPNG	PINUS PUNGENS	0	1	1	0
150	PNSRGD	PINUS RIGIDA	0	1	1	0
151	PNSSTR	PINUS STROBUS	0	1	1	0
152	PRNPNS	PRUNUS PENSYLVANICA	0	1	0	1
153	QRCRBR	QUERCUS RUBRA	1	1	1	1
154	RHDARB	RHODODENDRON ARBORESCENS	0	1	1	0
155	RHDBKR	RHODODENDRON BAKERI	1	0	0	0
156	RHDCLN	RHODODENDRON CALENDULACEUM	1	1	1	1
157	RHDCTW	RHODODENDRON CATAWBIENSE	0	1	0	0
158	RHDNDF	RHODODENDRON NUDIFLORUM	1	0	0	0
159	RHDVSC	RHODODENDRON VISCOSUM	0	1	1	0
160	RHSRDC	RHUS RADICANS	0	0	0	1
161	SLXHML	SALIX HUMILIS	1	1	1	1
162	SMBCND	SAMBUCUS CANADENSIS	0	1	0	0
163	SMXRTN	SMILAX ROTUNDIFOLIA	0	0	1	1
164	SRBAMR	SORBUS AMERICANA	0	0	0	1
165	TSGCND	TSUGA CANADENSIS	0	1	1	0
166	VCCCNS	VACCINIUM CONSTABLAEI	1	1	0	0
167	VCCHRS	VACCINIUM HIRSUTUM	1	1	1	1
168	VCC	VACCINIUM SPP.	1	0	0	0

OBS	SPECIES	NAME	G1	G2	G3	G4
169	VCCVCL	VACCINIUM VACILLANS	1	1	1	1
170	VBRCSS	VIBURNUM CASSINOIDES	0	0	0	1
171	VBRDNT	VIBURNUM DENTATUM	0	0	1	0

OBS	SPECIES	NAME	SP1	SP2	SP3	SP4
1	ATHASP	ATHYRIUM ASPLENIOIDES	0	1	0	0
2	BTRDSS	BOTRYCHIUM DISSECTUM	1	0	1	1
3	DNNPNC	DENNSTAEDTIA PUNCTILOBULA	0	1	1	1
4	LYCLCD	LYCOPODIUM LUCIDULUM	0	0	0	1
5	OSMCLT	OSMUNDA CLAYTONIANA	0	0	0	1
6	PLSACR	POLYSTICHUM ACROSTICHOIDES	0	0	1	0
7	ACHMLL	ACHILLEA MILLEFOLIUM	0	1	1	1
8	AGNRPN	AGROPYRON REPENS	0	1	1	0
9	AGSALB	AGROSTIS ALBA	1	1	1	0
10	AGSSCB	AGROSTIS SCABRA	0	0	0	1
11	ANGTPQ	ANGELICA TRIQUINATA	0	1	1	1
12	ASTCRD	ASTER CORDIFOLIUS	0	0	0	1
13	ASTDVR	ASTER DIVARICATUS	0	1	1	1
14	ASTLTR	ASTER LATERIFLORUS	1	0	1	1
15	ASTLWR	ASTER LOWRIEANUS	0	0	0	1
16	ASTPLS	ASTER PILOSUS	0	0	0	1
17	ASTPNC	ASTER PUNICEUS	0	0	1	0
18	ASTUND	ASTER UNDULATUS	0	0	1	0
19	CRXAST	CAREX AESTIVALIS	0	0	0	1
20	CRXBRN	CAREX BRUNNESCENS	1	1	0	0
21	CRXDBL	CAREX DEBILIS	0	1	1	1
22	CRXINT	CAREX INTUMESCENS	0	1	1	1
23	CRXLPN	CAREX LEPTONERVIA	1	0	0	0
24	CRXNRM	CAREX NORMALIS	0	1	1	0
25	CRXPNS	CAREX PENSYLVANICA	0	0	0	1
26	CRXSWN	CAREX SWANII	0	0	0	1
27	CRXVLP	CAREX VULPINOIDEA	0	1	0	0
28	CERAPV	CERASTIUM SP.	0	1	1	0
29	CHYLCN	CHRYSANTHEMUM LEUCANTHEMUM	0	1	1	0
30	CSCPST	CUSCUTA ROSTRATA	0	0	1	1
31	DCTGLM	DACTYLIS GLOMERATA	0	1	1	0
32	DTHCMP	DANTHONIA COMPRESSA	1	1	1	1
33	DTHSPC	DANTHONIA SPICATA	0	1	0	1
34	EPGRPN	EPIGAEA REPENS	0	0	1	0
35	EPTRGS	EUPATORIUM RUGOSUM	0	1	1	0
36	FRGVRG	FRAGARIA VIRGINIANA	0	1	0	0
37	GNTDCR	GENTIANA DECORA	0	0	1	0
38	HCHAMR	HEUCHERA AMERICANA	0	1	0	0
39	HCHVLL	HEUCHERA VILLOSA	1	0	0	0
40	HRMPNC	HIERACIUM PANICULATUM	0	1	1	1
41	HRMSCB	HIERACIUM SCABRUM	0	0	1	0
42	HLCLNT	HOLCUS LANATUS	0	1	1	0
43	HSTPRP	HOUSTONIA PURPUREA	0	1	1	0
44	HSTSRP	HOUSTONIA SERPYLLIFOLIA	0	1	1	1
45	HYPMTC	HYPERICUM MITCHELLIANUM	1	1	0	0
46	HYPPNC	HYPERICUM PUNCTATUM	1	0	1	0
47	JNCEFF	JUNCUS EFFUSUS	1	0	0	0
48	JNCTNS	JUNCUS TENUIS	1	1	1	0
49	LTCCND	LACTUCA CANADENSIS	0	0	1	1
50	LLMSPB	LILIUM SUPERBUM	0	0	1	0
51	LZLECH	LUZULA ECHINATA	0	1	0	0
52	LYSQDR	LYSIMACHIA QUADRIFOLIA	0	1	1	0
53	MNHCND	MATANTHEMUM CANADENSE	0	1	0	0
54	MLXUNF	MALAXIS UNIFOLIA	0	0	1	0
55	PRTQNQ	PARTHENOCISSUS QUINQUEFOLIA	0	0	1	0
56	PDCCND	PEDICULARIS CANADENSIS	0	0	0	1

OBS	SPECIES	NAME	SP1	SP2	SP3	SP4
57	PHMPRT	PHLEUM PRATENSE	1	1	1	0
58	PLTCLR	PLATANTHERA CILIARIS	0	1	1	1
59	POACMP	POA COMPRESSA	1	0	0	0
60	POAPRT	POA PRATENSIS	0	1	0	0
61	PLYCLN	POLYGONUM CILINODE	1	0	0	0
62	PLYSCN	POLYGONUM SCANDENS	0	1	0	0
63	PTNCND	POTENTILLA CANADENSIS	1	1	1	1
64	PNNALT	PRENANTHES ALTISSIMA	0	0	0	1
65	PNNRNN	PRENANTHES ROANENSIS	0	0	1	0
66	PNLVLG	PRUNELLA VULGARIS	0	1	1	0
67	RBSCND	RUBUS CANADENSIS	0	1	1	1
68	RDBHRT	RUDBECKIA HIRTA	1	1	0	0
69	RDBLCN	RUDBECKIA LACINIATA	0	1	0	0
70	RMXACT	RUMEX ACETOSELLA	0	1	1	1
71	RMXOBT	RUMEX OBTUSIFOLIUS	0	1	1	1
72	SNCSML	SENECIO SMALLII	0	1	0	0
73	SLNVRG	SILENE VIRGINICA	0	1	0	0
74	SLMCRL	SOLANUM CAROLINENSE	0	1	0	1
75	SLDARG	SOLIDAGO ARGUTA	0	0	1	0
76	SLDBCL	SOLIDAGO BICOLOR	0	0	0	1
77	SLDCRT	SOLIDAGO CURTISII	0	1	1	0
78	SLDODR	SOLIDAGO ODORA	0	0	1	1
79	SLDPBR	SOLIDAGO PUBERULA	0	0	1	0
80	SLDRNN	SOLIDAGO ROANENSIS	1	0	0	0
81	SLD	SOLIDAGO SPP.	1	1	1	1
82	STCCLN	STACHYS CLINGMANII	1	0	1	1
83	THSTRF	THASPIUM TRIFOLIATUM	0	0	0	1
84	TRDSBS	TRADESCANTIA SUBASPERA	0	0	1	0
85	TRVCRL	TRAUTVETTERIA CAROLINIENSIS	1	1	0	0
86	VRNOFF	VERONICA OFFICINALIS	1	0	1	0
87	VIOEMR	VIOLA EMARGINATA	1	0	0	0
88	VIOHST	VIOLA HASTATA	0	0	0	1
89	VIOLTS	VIOLA LATIUSCULA	1	0	0	0
90	VIOPRM	VIOLA PRIMULIFOLIA	1	0	0	0
91	VIOSGT	VIOLA SAGITTATA	1	1	0	0
92	VIOSRR	VIOLA SORORIA	1	0	0	0
93	VIO	VIOLA SPP.	1	1	1	1
94	ACRRBR	ACER RUBRUM	0	1	1	1
95	ACRSCR	ACER SACCHARUM	0	1	0	1
96	AESOCT	AESCULUS OCTANDRA	1	1	1	1
97	AMLLVS	AMELANCHIER LAEVIS	1	1	1	1
98	ARLSPN	ARALIA SPINOSA	0	0	1	0
99	ARNMLN	ARONIA MELANOCARPA	0	1	0	0
100	BTLLUT	BETULA LUTEA	0	1	1	1
101	CSTDNT	CASTANEA DENTATA	0	1	1	0
102	CRNFLD	CORNUS FLORIDA	0	0	1	0
103	CRTMCR	CRATAEGUS MACROSPERMA	1	1	1	1
104	DSPVRG	DIOSPYROS VIRGINIANA	0	0	0	1
105	FGSGRN	FAGUS GRANDIFOLIA	1	1	1	1
106	FRXAMR	FRAXINUS AMERICANA	0	1	1	1
107	GYLURS	GAYLUSSACIA URSINA	0	0	1	0
108	HMMVRG	HAMAMELIS VIRGINIANA	0	0	1	0
109	ILXMNT	ILEX MONTANA	0	1	1	0
110	ILXOPC	ILEX OPACA	0	0	1	0
111	KLMLTF	KALMIA LATIFOLIA	0	1	1	1
112	LYNLGS	LYONIA LIGUSTRINA	0	0	1	0

OBS	SPECIES	NAME	SP1	SP2	SP3	SP4
113	MGNACM	MAGNOLIA ACUMINATA	0	0	1	0
114	OXYARB	OXYDENDRUM ARBOREUM	0	1	1	1
115	PNSPNG	PINUS PUNGENS	0	0	1	0
116	PNSSTR	PINUS STROBUS	0	1	1	0
117	PRNPNS	PRUNUS PENSYLVANICA	0	1	1	1
118	PRNSRT	PRUNUS SEROTINA	0	0	0	1
119	QRCRBR	QUERCUS RUBRA	0	1	1	0
120	RHMCRL	RHAMNUS CAROLINIANA	0	0	0	1
121	RHDCLN	RHODODENDRON CALENDULACEUM	0	0	1	0
122	RHDCTW	RHODODENDRON CATAWBIENSE	0	1	0	1
123	RHDMXM	RHODODENDRON MAXIMUM	0	0	1	1
124	RHSCPL	RHUS COPALLINA	0	0	1	0
125	RIBRTN	RIBES ROTUNDIFOLIUM	0	0	1	0
126	SLXHML	SALIX HUMILIS	0	0	1	0
127	SMBCND	SAMBUCUS CANADENSIS	1	1	1	0
128	SMXRTN	SMILAX ROTUNDIFOLIA	0	1	1	0
129	SRBAMR	SORBUS AMERICANA	0	1	1	0
130	TSGCND	TSUGA CANADENSIS	0	0	0	1
131	VCCCNS	VACCINIUM CONSTABLAEI	0	1	1	0
132	VCCERY	VACCINIUM ERYTHROCARPUM	1	0	0	0
133	VCCHRS	VACCINIUM HIRSUTUM	0	1	1	1
134	VCC	VACCINIUM SPP.	0	0	0	1
135	VCCSTM	VACCINIUM STAMINEUM	0	1	0	0
136	VCCVCL	VACCINIUM VACILLANS	0	0	1	1
137	VBRCSS	VIBURNUM CASSINOIDES	0	1	1	0

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environment and cultural value of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.